Institute of Actuaries' Life Tables.

TABLES

DEDUCED FROM THE

MORTALITY EXPERIENCE

OF

LIFE ASSURANCE COMPANIES,

WITH AN

APPENDIX CONTAINING A COMPLETE SYSTEM OF

NOTATION

FOR LIFE CONTINGENCIES.

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DEDUCED FROM THE

MORTALITY EXPERIENCE

OF

LIFE ASSURANCE COMPANIES,

AS COLLECTED AND ARRANGED BY THE

INSTITUTE OF ACTUARIES

OF GREAT BRITAIN AND IRELAND:

WITH AN

INTRODUCTION EXPLANATORY OF THE CONSTRUCTION AND APPLICATION OF THE TABLES,

AND AN

APPENDIX CONTAINING A COMPLETE SYSTEM OF NOTATION FOR LIFE CONTINGENCIES.

Published by the Authority, and under the Superintendence, of the Institute.

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PREFACE.

In the Preface to "The Mortality Experience of Life Assurance Companies, collected by the Institute of Actuaries," published in May, 1869, it was stated, "The preparation of monetary and other Tables for official purposes is a work involving so much time, labour, and expense, that the Council of the Institute of Actuaries have decided not further to delay the publication of the original facts, on which they will have to be computed."

The liberality of several Life Assurance Companies promptly relieved the Council from all anxiety in regard to the expense attending the completion of so extensive a work. Their further contributions, in answer to a circular issued in June, 1869, amounted to £605, making the total Fund collected £1142. 5*s.* A List of the contributing Offices is appended to this Preface.

As a preliminary to the determination of the classes of monetary Tables to be computed, it was considered important—

1. That the Tables of Mortality deduced directly from the Observations should be graduated in such a manner as to preserve, to the utmost possible degree consistent with their practical use, all the original features of the Observations.

2. That further investigations should be made into the question of the effect of selection, with the view of deciding whether distinct monetary Tables should be given, applicable to assured lives from which that effect has in a great measure passed away.

The graduation of the three Tables, $\mathbf{H}^{\mathbf{M}}$, $\mathbf{H}^{\mathbf{F}}$, and $\mathbf{H}^{\mathbf{MF}}$, was kindly undertaken by Mr. Woolhouse, whose great skill and experience suggested to him a new method, combining in a probably unprecedented degree adaptation for all practical purposes with close adherence to the original facts. As this method cannot fail to be of great interest, the Tables, as adjusted by Mr. Woolhouse, together with his explanation of the process of adjustment, are printed at the end of the Introduction.

In order to examine more closely into the question of the effect of selection, a Table of Mortality was deduced from the Observations $\mathbf{H}^{\mathbf{M}}$, excluding the years of Assurance 0 to 4; this was similarly graduated by Mr. Woolhouse. It is designated by the symbol $\mathbf{H}^{\mathbf{M}(5)}$. The particular period adopted as most suitable generally for exclusion was determined by the marked difference, in the classified original data, between the first five years of assurance and the subsequent periods.

It was then decided, after a careful consideration of the whole subject, that Commutation Tables for Single Lives, and Values of Annuities to 4 places of decimals, at 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, and 6 per-cent, should be deduced from the graduated $\mathbf{H}^{\mathbf{M}}$ and $\mathbf{H}^{\mathbf{F}}$ Tables. It was also decided that similar Tables, at 3, $3\frac{1}{2}$, and 4 per-cent, should be deduced from the $\mathbf{H}^{\mathbf{M}(5)}$ Table. These were considered sufficient to afford to Life Assurance Companies a basis for approximate valuations of their position and prospects independent of the influence of recent selection. The Table $\mathbf{H}^{\mathbf{MF}}$ has not been made a basis of calculation in the present volume.

The Tables for Two Lives comprise an entire set of Joint Life Annuities for every combination of ages from (10, 10) upwards, at 3, $3\frac{1}{2}$, and 4 per-cent, as being the rates generally sufficient for official calculations. The values of Annuities on the last survivor of two lives for the same combinations of age are also given at the same rates of interest, and by a simple arrangement fill up, with a new and valuable set of Tables, what would otherwise have been a great waste of space in the Joint Life Columns.

The laborious and responsible task of superintending the computation and printing of all these Tables was undertaken in the most disinterested manner by Mr. Peter Gray, whose name will be accepted as a guarantee of the accuracy and consequent value of the completed results.

To the Tables themselves Mr. Gray has written an Introduction, fully explaining the methods of formation and various modes of their application. This renders it unnecessary for the Council to do more than draw attention to his clear and able exposition: but they desire, at the same time, to record their sense of the great obligations which all interested in the present work are under to Mr. Gray for his invaluable assistance in its production.

Other Tables are required to complete the Canon, such as Single and Annual Premiums for Survivorships and Endowments and the values of Temporary and Deferred Annuities, but it appears to the Council that it would not be advisable to delay any longer the publication of the present volume, which, with these explanations, they now submit to the Profession.

The Council have thought it desirable to append to this volume a comprehensive Scheme of Notation, settled by a Special Committee of Actuaries, after long and careful consideration of the subject, aided by valuable suggestions and co-operation from various quarters. The Council believe that this notation will be found extremely well adapted to express all the benefits that occur in practice, and they strongly recommend it for general adoption, in the expectation that its use will contribute materially to advance the study of life contingencies by promoting exactness of thought and expression.

LIST OF CONTRIBUTING OFFICES.

British Equitable Assurance Company.
Briton Medical and General Life Association.
Church of England Life Assurance Institution.
Clergy Mutual Assurance Society.
Clerical, Medical, and General Life Assurance Society.
Commercial Union Assurance Company.
Crown Life Assurance Company.
Eagle Insurance Company.
English and Scottish Law Life Assurance Association.
Equity and Law Life Assurance Society.
Friends' Provident Institution.
General Reversionary and Investment Company.
Guardian Fire and Life Assurance Company.
Hand-in-Hand Fire and Life Insurance Society.
Imperial Life Insurance Company.
Law Union Fire and Life Insurance Company.
Legal and General Life Assurance Society.
Liverpool, London, and Globe Insurance Company.
London and Provincial Law Assurance Society.
London Assurance Corporation.
Metropolitan Life Assurance Society.
National Life Assurance Society.
National Union Assurance Company.
North British and Mercantile Insurance Company.
Northern Assurance Company.
Pelican Life Assurance Company.
Prudential Assurance Company.
Queen Insurance Company.
Royal Farmers' Insurance Company.
Scottish Imperial Insurance Company.
Sovereign Life Assurance Company.
Sun Life Assurance Society.
Universal Life Assurance Society.
West of England Fire and Life Insurance Company.
Whittington Life Assurance Company.

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TABLES.

I.—One Life.

*** Under each of the three Mortality Tables, HM, HF, and HM(5) are given :—

First, a Table of Elementary Values, with Results deduced from it involving the rate of mortality only ; and,

Secondly, the following Tables involving the rates of both mortality and interest, for each rate of interest employed, namely :—

1. Commutation Table ;
2. Logarithms of the same ;
3. Results deduced from the Commutation Table.

The rates of interest will be apparent from the following enumeration :—

II.—Two Lives.

*** Of Two-Life Tables the values given, deduced from H^M only, are those of Annuities on Joint Lives and on Last Survivors. As these, for the same rate of interest, occupy between them a single quadrangular space, a reference for each rate of interest is sufficient.

INTRODUCTION.

THREE distinct Mortality Tables are, in the present work, made bases of computation. They are designated respectively by the suggestive symbols, $\mathbf{H}^{\mathbf{M}}$, $\mathbf{H}^{\mathbf{F}}$, and $\mathbf{H}^{\mathbf{M}(5)}$. The first two, $\mathbf{H}^{\mathbf{M}}$ and $\mathbf{H}^{\mathbf{F}}$, have been deduced, by a highly scientific process of graduation, devised and applied by Mr. Woolhouse,* from the two, similarly designated, on pages 273 to 276 of the *Mortality Experience of Life Assurance Companies, collected by the Institute of Actuaries*, published in 1869. The original tables commence at age 0, with a radix of 10,000. The new tables, on the other hand, commence with a radix of 100,000 at age 10, the numbers observed upon, between ages 0 and 10, being considered too small to afford trustworthy results; and therefore the numbers-living, in corresponding tables, do not admit of being directly compared. It will be shown hereafter how closely the results of the graduated tables are assimilated to those of the tables from which they have been respectively deduced.

As regards $\mathbf{H}^{\mathbf{M}(5)}$, the third table which is here made a basis of computation, there is no table in the *Experience* volume to which it holds a relation corresponding to that held by the two $\mathbf{H}^{\mathbf{M}}$ and $\mathbf{H}^{\mathbf{F}}$, to the tables similarly designated in the volume referred to. It has been formed from the same data as $\mathbf{H}^{\mathbf{M}}$, when modified by the exclusion from them of the experience of the first five years of assurance. Comparison of the results of this table with the corresponding results of $\mathbf{H}^{\mathbf{M}}$ serve to show the effect of recency of selection.

The arrangement that has been adopted, in regard to the Single-Life Tables, has been to group together, under each fundamental table, all the tables deduced from it. It is

* Much attention has been given by Mr. Woolhouse to the subject of the graduation of tables. A full description of his method, as applied to the Table $\mathbf{H}^{\mathbf{M}}$, follows this Introduction. In the application of this method every fact in the table operated upon has its due weight accorded to it; and the effect is, that in the resulting table, while asperities are softened down, every well-pronounced characteristic in the original is faithfully reproduced.

believed that this arrangement will be found to be more conducive to facility in the use of the tables than any other that could be suggested.

The Two-Life Tables, which have been deduced from $\mathbf{H^M}$, follow the Single-Life Tables.

I. Of the Single-Life Tables.

The Single-Life Tables, deduced from the several fundamental tables, may be classified as follows:—

1. An Elementary Table. This contains the Mortality Table and such deductions from it as are requisite for the construction of the succeeding tables, and of any others that may be proposed.
2. Results involving the rate of mortality only. These are p_x, q_x and $\mathring{e}_x$.
3. A Commutation Table.
4. Logarithms and Cologarithms of the principal columns of the Commutation Table.
5. Results deduced from the Commutation Table. These are a_x, A_x and ϖ_x.

The monetary tables, comprising 3, 4 and 5 of the above enumeration, are given at various rates of interest. For each of the tables $\mathbf{H^M}$ and $\mathbf{H^F}$ they are given at the following six rates, viz., 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5 and 6 per cent.; and for $\mathbf{H^{M(5)}}$ they are given at the three rates 3, $3\frac{1}{2}$ and 4 per cent.

The tables as above classified will be now more particularly described; and attention will be directed to any specialties in their form, or in the methods employed in their construction, that may seem to deserve or to demand notice.

The illustrative references will be solely or chiefly to the table $\mathbf{H^M}$ and the deductions from it, with interest, where this element enters, at 3 per cent.

1. *The Elementary Table.*

The functions here tabulated for each age are l_x and d_x, with their logarithms and cologarithms; and also the logarithms and cologarithms of p_x, the logarithmic functions being in all cases accompanied by their differences. It has not been usual, for what reason is not apparent, to tabulate $\log d_x$; nor have the differences been heretofore tabulated. These find their uses, as will hereafter appear, in the construction of tables.

The bases of the logarithmic portion of the Elementary Table are $\log l_x$ and $\log d_x$. The manner in which the remaining columns are deduced from the columns containing these functions is sufficiently obvious; and it is therefore necessary to explain only the methods employed for their verification.

Since, u_x being any function of x,

$$u_x + \Delta u_x + \Delta u_{x+1} + \ . \ . \ . \ + \Delta u_{x+n-1} = u_{x+n},$$

it appears that if in any column of differences we insert at intervals the proper values of u_x, they will in each case be the sum of all the terms which precede them. Thus, referring to p. 2, if in the blank spaces in the column headed $\log p_x$ (which contains the differences of $\log l_x$) we insert $\log l_{10}$, $\log l_{15}$, $\log l_{20}$, &c., the column will be verified by continuous addition. But the requisite additions can very well be made without the actual transference of the terms from the adjoining column. All the columns of differences were checked in this way.

Again, since the sum of a logarithm and its complement is 0, so the sum of any number of logarithms and their complements is also 0. The complementary columns were verified therefore by adding together, as they stand, the corresponding groups of five in the two columns.

2. *Results involving the Rate of Mortality only.*

These results, as respects $\mathbf{H}^{\mathbf{M}}$, are on p. 6. They consist of p_x, q_x and $\mathring{e}_x$, for each age. The first two are complements of each other to unity; and they might have been formed by taking out the numbers corresponding to $\log p_x$ in the Elementary Table, and subtracting the results from unity. But it was preferred to employ for this purpose a method which brings into use certain of the tabulated functions; and as it is typical of other operations to follow, it will be described at some length.

Since $$q_x = \frac{d_x}{l_x},$$

and consequently, $\log q_x = \log d_x - \log l_x$
$= \log d_x + \text{colog}\, l_x$;

therefore $\Delta \log q_x = \Delta \log d_x + \Delta\, \text{colog}\, l_x$
$= \Delta \log d_x + \text{colog}\, p_x$,

(since $\Delta\, \text{colog}\, l_x = \text{colog}\, p_x$).

Now $\log q_{x+1} = \log q_x + \Delta \log q_x$.

Hence, by substitution,

$$\log q_{x+1} = \log q_x + \Delta \log d_x + \text{colog}\, p_x.$$

That is, we shall pass from $\log q_x$ to $\log q_{x+1}$ by adding to the former the differences of its components ; and the logarithms of the series q_x will consequently be formed by continuous addition.

The formation of the first few terms of the series is here exhibited.

	Log q_x	q_x	p_x $(1-q_x)$
Log d_{10}	2·690196		
*Col. l_{10}	$\bar{5}$·000000		
10	$\bar{3}$·690196	·004900	·995100
	908595		
	2133		
11	·600924	·003990	·996010
	918405		
	1736		
12	·521065	·003319	·996681
	942196		
	1444		
13	·464705	·002915	·997085
	975177		
	1268		
14	·441150	·002762	·997238
	15680		
	1201		
15	·458031	·002871	·997129
*	*	*	*

Verification.

Log d_{15}	2·450249
Col. l_{15}	$\bar{5}$·007782
15	$\bar{3}$·458031

* Col. is adopted in the illustrative examples as an abbreviation for *Colog*, in order to range better with *Log*.

Log d_{10} is set down on the first line, and on the fourth, seventh, and every third succeeding line the differences of $\log d_x$ in order, commencing with $\Delta \log d_{10}$; $\operatorname{colog} l_{10}$ is set down on the second line, and the differences of $\operatorname{colog} l_x$, in other words the successive terms of $\operatorname{colog} p_x$, commencing with $\operatorname{colog} p_{10}$, on the fifth, eighth, &c., that is, on every third line as before. The third, sixth, ninth, &c., lines thus left vacant, are intended to receive the results of the final additions, which results are the logarithms of the values sought. Before proceeding to the final additions the terms set down should be added continuously in groups; and the successive sums, which should be previously formed from the Elementary Table, and inserted in their places, will serve, as they are reached in order, to verify also the final additions.

In most, or all, of the logarithmic series with which we have to do, the increase (or decrease) in the successive terms is so gradual that it is not necessary, in computation, to write the index of more than the first term. We have sufficient intimation of a change in the index by that which takes place at the same time in the mantissa of the logarithm. It is thus unnecessary to set down the indexes of the differences, and they are not inserted in the tables.

It is frequently desirable to form a series in reverse instead of direct order; and the Elementary Table furnishes the means of doing so. Thus:—

Since $\log q_{x+1} = \log q_x + \Delta \log d_x + \operatorname{colog} p_x$,

therefore, $\log q_x = \log q_{x+1} - \Delta \log d_x - \operatorname{colog} p_x$

$$= \log q_{x+1} + \Delta \operatorname{colog} d_x + \log p_x,$$

($\Delta \operatorname{colog} d_x$ being the negative difference of $\log d_x$, marked $-\Delta$ in the Elementary Table); and the series may be formed by continuous addition, as before.

The following is the construction of the last six terms; and the results of this and the preceding formation may be compared with the complete table on p. 6.

	Log q_x	q_x	p_x $(1-q_x)$
Log d_{97}	0·954243		
Col. l_{97}	$\bar{1}$·045757		
97	0·000000	1·000000	·000000
	647817		
	264047		
96	·911864	·816327	·183673
	332438		
	559862		
95	·804164	·637036	·362964
	208517		
	692583		
94	·705264	·507300	·492700
	147020		
	766578		
93	·618862	·415778	·584222
	114799		
	812035		
92	·545696	·351314	·648686
*	*	*	*
Log d_{92}	2·404834		
Col. l_{92}	$\bar{3}$·140862		
92	$\bar{1}$·545696		

It is hardly necessary to remark that, the column q_x shewing the annual decrement on *a unit of life* at each age, it shews also, by the proper disposition of the decimal point, the annual mortality per hundred, per thousand, &c. Thus, we see that at age 52 the mortality is $1\frac{3}{4}$ per cent., or $17\frac{1}{2}$ per thousand, and so on.

The next result is $\mathring{e}_x$, the Average Duration of Life at each age. The column has been formed by the aid of the well-known formula,

$$e_x = p_x(1 + e_{x+1}),$$

in which e_x denotes the Curtate Duration at age x, and from which the Complete Duration, $\mathring{e}_x$, is deduced by addition of ·5 to each term.

The formation of the first few terms of the series (the last few as the table is arranged) is here subjoined. The initial term, e_{97} being 0, is $\log e_{96} = \log p_{96}$. The operation is conducted by means of the table Log $(1+x)$ in Gray's *Tables and Formulæ*, and verification is obtained from point to point by the use of the formula,

$$e_x = \frac{l_{x+1} + l_{x+2} + \cdot \cdot \cdot \cdot}{l_x}$$

	Log e_x	e_x	$\overset{\circ}{e}_x$
97		·0000	·5000
96	$\bar{1}$·264047	·1837	·6837
	559862		
	073225		
	7		
95	633094	·4296	·9296
	692583		
	155195		
	28		
94	847806	·7044	1·2044
	766578		
	231564		
	2		
93	998144	·9957	1·4957
	812035		
	300081		
	22		
92	112138	1·2946	1·7946

*   *   *   *

$$\frac{l_{93}+l_{94}+\ .\ .\ .\ .\ l_{97}}{l_{92}}=\frac{936}{723}$$

Log 936	2·971276
Col. 723	$\bar{3}$·140862
92	0·112138

Comparison of the series thus formed with the corresponding series formed from the same table, **H^M^**, previous to graduation, *Experience*, pp. 281, 282, gives, for ages 10 to 90, the following result:—In 20 cases the corresponding terms of the two series are identical; in 26 they differ by ±·01; in 11 they differ by ±·02; in 12 by ±·03; in 2 by ±·04; in 1 by −·05; in 3 by ±·06; in 3 by ±·08; in 1 by +·10; in 1 by −·15; and in 1 by −·18.

Or it may be put thus:—The sum of the positive deviations is ·81, and that of the negative deviations is 1·01; and we have

20 cases of coincidence;

34 with an average deviation of $+{\cdot}024$;

and 27 " " " $-{\cdot}037$.

From which it appears that the graduated table may be unhesitatingly accepted as a faithful representation, but deprived of its angularities, of that from which it is deduced.

A similar comparison to the foregoing, instituted between the Average Durations deduced from the original and the graduated H^F tables, for the same ages, 10 to 90, gives a somewhat less favourable result. The former is to be found in the *Experience* volume, on pp. 281, 282, and the latter on p. 60 of the present work.

Here we have:—3 cases in which the corresponding terms are identical; 15 in which they differ by $\pm{\cdot}01$; 14 in which they differ by $\pm{\cdot}02$; 14 by $\pm{\cdot}03$; 5 by $\pm{\cdot}04$; 5 by $\pm{\cdot}05$; 3 by $\pm{\cdot}06$; 2 by $-{\cdot}07$; 1 by $+{\cdot}08$; 3 by $-{\cdot}09$; 2 by $-{\cdot}10$; 3 by $\pm{\cdot}11$; 3 by $\pm{\cdot}12$; 1 by $-{\cdot}13$; 1 by $+{\cdot}14$; 1 by $+{\cdot}16$; 1 by $+{\cdot}18$; 1 by $-{\cdot}19$; 1 by $+{\cdot}24$; 1 by $-{\cdot}27$; and 1 by $+{\cdot}43$.

The totals are, of positive deviation 2·48, and of negative 2·12; and we have finally:—

3 cases of coincidence;

38 with an average deviation of $+{\cdot}065$;

40 " " " $-{\cdot}053$.

The deviations are here, as already remarked, confined within less narrow limits than in the case of the H^M table. The cause of this is, that the original H^F table contains more *asperities* than the original H^M; and this again arises, no doubt, from the *comparative* smallness of the number of lives entered in the observations on which it is founded. And it is to be borne in mind that the deviations (which legitimately arise in the process of graduation) are in the direction of softening down the asperities by which, like other results of original observations, the present table is characterized. The graduated table may therefore be confidently accepted as an exponent of the law of mortality likely to prevail amongst a class similar to that subjected to observation.

The tables $\mathbf{H}^{\mathrm{M}}$ and $\mathbf{H}^{\mathrm{M}(5)}$ are formed, as has been already stated, from the same series of observations. In the case of the former table the lives are brought under observation at the date of assurance, that is, at the period of their selection, as healthy lives; in the case of the latter table they are not brought under observation till they have been assured five* years. Hence, if recency of selection has any effect in modifying the rate of mortality in a community, this ought to become apparent on comparison of the results of the two tables formed as above described. And accordingly we find, on referring to the Average Durations, pp. 6 and 114, that those on the latter page, derived from the table $\mathbf{H}^{\mathrm{M}(5)}$, are throughout less than those on the former, derived from the table $\mathbf{H}^{\mathrm{M}}$. The difference, which at the outset is 1·83 years, remains nearly stationary for 12 terms, after which it gradually decreases; but it does not entirely disappear till the close of the series. The conclusion then is, that recency of selection exercises a by no means unimportant influence on the rate of mortality; and the measure of its effect in the present case is the series of differences between corresponding terms in the two sets of Average Durations now under consideration.

3. *The Commutation Table.*

We now come to the tables involving the rate of interest as well as the rate of mortality. The principal and fundamental of these is the Commutation Table. It is necessary to say, that in the Commutation Tables here given, Davies's relation of the several columns to each other has been adopted; so that we always have

$$a_x = \frac{N_x}{D_x},$$

and so on. And hence the formulæ for their application are those of Professor De Morgan's paper in the *Companion to the Almanac* for 1840, reprinted in the *Journal of the Institute*, vol. xii., p. 328. This form has been adopted after fully

* More exactly four and a half years, on the average.

considering and duly weighing the arguments that have of late years been adduced for a departure from it, and which need not here be recapitulated.

The methods employed in the construction of the fundamental columns will now be described. And first as to Column D.

We have $\log D_x = \log l_x + \log v^x$,

and $\log D_{x+1} = \log l_{x+1} + \log v^{x+1}$;

therefore $\Delta \log D_x = \log p_x + \log v$

$= \log vp_x$.

Hence, since $\log D_{x+1} = \log D_x + \Delta \log D_x = \log D_x + \log vp_x$, it appears that the column $\log D_x$ may be formed in direct order by the continuous addition to $\log D_{10}$ of the terms of the series $\log vp_x$. But it is more convenient, by facilitating the formation of Column N, to form $\log D_x$ in reverse order. From the foregoing we have

$$\begin{aligned}\log D_x &= \log D_{x+1} - \log vp_x \\ &= \log D_{x+1} + \text{colog}\ vp_x.\end{aligned}$$

Hence, commencing with $\log D_{97}$, the column is formed by the continuous addition of colog v + colog p_x.

A specimen of the operation follows :—

	Log v^x		Log D_x	D_x and N_x	
100	$\bar{2}$·716278	Log v^{97}	$\bar{2}$·754789		
99	·729115	„ l_{97}	0·954243		
98	·741952	97	$\bar{1}$·709032	·5117	96
97	·754789		012837		
96	·767626		735953		
95	·780464+				
94	·793301	96	·457822	2·8696	
93	·806138		012838	3·3813	95
92	·818975		440138		
91	·831813+	95	·910798+	8·1433	
90	·844650		012837	11·5246	94
89	·857487		307417		
88	·870324	94	·231052	17·0236	
87	·883161		012837	28·5482	93
86	·895999+		233422		
85	·908836	93	·477311	30·0131	
*	*		012837	58·5613	92
			187965		
		92	·678113		

		58·5613	
92	·678113	47·6555	
	012838	106·2168	91
	162878		
91	·853829+	71·4215	
	012837	177·6383	90
	142337		
90	·009003	102·095	
	012837	279·733	89
	126794		
89	·148634	140·810	
	012837	420·543	88
	118786		
88	·280257	190·659	
	012837	611·202	87
	114203		
87	·407297	255·445	
	012838	866·647	86
	107713		
86	·527848+	337·169	
	012837	1203·816	85
	102311		
85	·642996	439·538	
		1643·354	84
*	*	*	*

Log v^{85}	$\bar{2}$·908836
,, l_{85}	3·734160
85	2·642996

The first line is occupied by log v^{97}, and the fourth, seventh, tenth, &c., by colog v; the second line is occupied by log l_{97}, and the fifth, eighth, eleventh, &c., by the successive terms of colog p_x in reverse order. Before proceeding to the additions it is necessary to introduce certain corrections. The true value of colog v is ·012837,2247 . . . . , and the neglect of the figures beyond the sixth would give rise to constantly increasing error, which, at the close in log D_{10}, would amount to no less than 20. To counteract this a periodical correction is made, and the points where it is to be introduced are easily determined by reference to the series log v^x, a portion of which, in reverse order to correspond with the order in which the table is being formed, is given in the margin.* Commencing with $\log v^{97}$ (which is the term that enters into $\log D_{97}$) and attending to the last figures only, we see that the differences are 7, 8, 7, 7, 7, 8, 7, 7, 7, 7, 8, ... Let the terms on which the 8's fall be marked with +, meaning that those terms have been increased by unity. The marked terms here are 95, 91, 86, &c., and the terms in $\log D_x$ corresponding to those ages will thereupon have to be similarly increased, since $\log D_x = \log l_x + \log v^x$. The + marks are therefore placed against the proper ages in the working column, and it is then seen that what is requisite is to alter the value of colog v next preceding each marked line from ·012837 to ·012838. This correction being made† the addition is proceeded with, and the successive sums are the terms of the series $\log D_x$, true to the nearest unit in the last place.

It is obvious that the frequent writing of colog v may easily be avoided. It should be written at the bottom of a card; and this being held over the sum last formed, the logarithm can be included in the next summation. This method will be exemplified in the formation of $\log C_x$.

The numbers corresponding to $\log D_x$ were taken out by one computer and carefully examined by another. Further verification was obtained when Columns N and M were formed, as will be shewn hereafter.

The formation of a portion of Column N is shown; but it is unnecessary to exemplify that of Column S.

The method employed for the formation of Column C will now be described.

We have

$$\log C_x = \log v_{x+1} + \log d_x.$$

Hence,

$$\Delta \log C_x = \log v + \Delta \log d_x.$$

* A six-figure table of $\log v^x$, which shall be true in the last place, cannot be formed from a seven-figure table, since we are left in doubt as to whether or not a terminal 5 in the seventh place indicates an increase in the sixth. And in especial it cannot be formed from Mr. David Jones's values of this function, these being very incorrect in the last place, particularly the 4 per-cent. column. An excellent set of tables of $\log v^x$, extending to ten places, and therefore suited for every purpose, is given in Mr. William Thomas Thomson's *Actuarial Tables*, to which work, Mr. Thomson informs his readers, it was contributed by Mr. Filipowski.

† The corrected figures are printed in heavier type.

Consequently, for the formation of $\log C_x$ in direct order, we have

$$\log C_{x+1} = \log C_x + \Delta \log C_x$$
$$= \log C_x + \log v + \Delta \log d_x\,;$$

and for the formation in reverse order, which is the more convenient, we have

$$\log C_x = \log C_{x+1} + \operatorname{colog} v + \Delta \operatorname{colog} d_x\,;$$

in which $\Delta \operatorname{colog} d_x$ is the function occupying the column marked $-\Delta$ in the Elementary Table.

The following is an example of the formation:—

	Log C_x	C_x and M_x	
Log v^{98}	$\bar{2}$·741952		
,, d_{97}	0·954243		
97	$\bar{1}$·696195	·4968	97
	647817		
96	·356849	2·2743	
	332438	2·7711	96
95	·702124	5·0365	
	208518	7·8076	95
94	·923479 +	8·3845	
	147020	16·1921	94
93	·083336	12·1154	
	114799	28·3075	93
92	·210972	16·2544	
	112362	44·5619	92
91	·336171	21·6856	
	93465	66·2475	91
90	·442473 +	27·6995	
	83945	93·9470	90
89	·539255	34·6143	
	94270	128·5613	89
88	·646362	44·2957	
	99304	172·8570	88
87	·758503	57·3460	
	85411	230·2030	87
86	·856751	71·9036	
	82553	302·1066	86
85	·952141 +	89·5656	
		391·6722	85
*	*	*	*
Log d_{85}	3·056142		
v^{96}	$\bar{2}$·895999		
85	1·952141		

The formation here is effected in the manner just referred to. The only addends written down are the terms of the series $\Delta \operatorname{colog} d_x$ (in reverse order), and $\operatorname{colog} v$ is included in each summation (after the first) by means of a card.

In consequence of the constant addend, $\operatorname{colog} v$, not being set down, the corrections rendered necessary by its curtailment to six places must in this formation be applied to the terms of $\Delta \operatorname{colog} d_x$. Their places are determined at once by reference to the formation of $\log D_x$. In the present formation the marked terms are those corresponding to the ages one year younger than those to which they correspond in the last-mentioned formation. The powers of v which there enter into D_x, enter here into C_{x-1}. Hence, applying the marks, and increasing the addend immediately preceding each by a unit in the last place, continuous addition gives the terms of $\log C_x$ true to the nearest figure.

The numbers being taken out and examined, the formation of Column M is proceeded with, and a specimen of the operation is exhibited.

We can now procure verification of all the preceding work.

Since $$M_x = vN_{x-1} - N_x,$$
we have $$M_{85} = vN_{84} - N_{85};$$
and the formula is applied as follows :—

103)1643354(	1595490	vN_{84}.
613	1203816	N_{85}.
983	391674	M_{85}.
565		
504		
92		

This process is easier than the logarithmic one, when, as here, division by $1+i$ is used instead of multiplication by v. It also, usually, gives us one or two figures more in the result than can be obtained by the use of logarithms.

A similar relation holds between the Columns S and R. Thus,

$$R_x = vS_{x-1} - S_x.$$

And by the application of these formulæ the whole of the Commutation Tables in the present volume have been verified, from point to point.

4. *Logarithms and Cologarithms of the Principal Columns of the Commutation Table.*

This table, which contains also the differences of the logarithms enumerated, occupies the four pages next following each of the Commutation Tables. The foundations of the table are the columns containing $\log D_x$, $\log N_x$ and $\log M_x$; and the manner in which the remaining columns are derived from these is sufficiently obvious to preclude the necessity for description. The columns were severally verified in the same way as the corresponding columns of the Elementary Table.

5. *Results derived from the Commutation Table.*

The results here tabulated are a_x, A_x and ϖ_x, the values of annuities, and the single and annual premiums for assurance of a unit.

They were formed as follows:—

1. $$a_x = \frac{N_x}{D_x};$$

$\therefore$ $$\log a_x = \log N_x + \text{colog } D_x.$$

Hence, $$\Delta \log a_x = \Delta \log N_x + \Delta \text{ colog } D_x,$$
$$= \Delta \log N_x + \text{colog } vp_x;$$

and $$\log a_{x+1} = \log a_x + \Delta \log a_x$$
$$= \log a_x + \Delta \log N_x + \text{colog } vp_x.$$

2. Similarly:—

$$A_x = \frac{M_x}{D_x},$$

and $$\log A_x = \log M_x + \text{colog } D_x.$$
$$\Delta \log A_x = \Delta \log M_x + \text{colog } vp_x.$$

$\therefore$ $$\log A_{x+1} = \log A_x + \Delta \log A_x$$
$$= \log A_x + \Delta \log M_x + \text{colog } vp_x.$$

3. And finally:—

$$\varpi_x = \frac{M_x}{N_{x-1}},$$

and $$\log \varpi_x = \log M_x + \text{colog } N_{x-1}.$$
$$\Delta \log \varpi_x = \Delta \log M_x + \Delta \text{ colog } N_{x-1}.$$

$\therefore$ $$\log \varpi_{x+1} = \log \varpi_x + \Delta \log \varpi_x$$
$$= \log \varpi_x + \Delta \log M_x + \Delta \text{ colog } N_{x-1}.$$

The following are examples of the three operations :—

	Log a_x	a_x	Log A_x	A_x	Log ϖ_x	ϖ_x
	6·254516		4·298988		4·298988	
	$\bar{5}$·128372		$\bar{5}$·128372		$\bar{7}$·727862	
10	1·382888	24·1484	$\bar{1}$·427360	·267523	$\bar{2}$·026850	·010638
	982268		992208		992208	
	14971		14971		17622	
11	·380127	23·9953	·434539	·271981	·036680	·010881
	982136		993771		993771	
	14573		14573		17732	
12	·376836	23·8142	·442883	·277257	·048183	·011173
	981984		994922		994922	
	14281		14281		17864	
13	·373101	23·6103	·452086	·283195	·060969	·011507
	981818		995637		995637	
	14105		14105		18016	
14	·369024	23·3897	·461828	·289620	·074622	·011875
	981641		995961		995961	
	14039		14039		18182	
15	·364704	23·1581	·471828	·296366	·088765	·012268
	981454		995896		995896	
	14086		14086		18359	
16	·360244	22·9215	·481810	·303256	·103020	·012677
*	*	*	*	*	*	*
	6·145817		4·267383		4·267383	
	$\bar{5}$·214427		$\bar{5}$·214427		$\bar{7}$·835637	
16	1·360244		$\bar{1}$·481810		$\bar{2}$·103020	

The initial values are log N_{10} + colog D_{10}, log M_{10} + colog D_{10}, and log M_{10} + colog N_9, the addends being in accordance with the preceding formulæ. Neither colog N_9 nor its difference is in the table. They are easily formed, thus:—

N_{10}	1796867		
D_{10}	74409		
N_9	1871276	log	6·272138
		col.	$\bar{7}$·727862
		Δ	017622

The verifications at the bottom are log N_{16} + colog D_{16}, log M_{16} + colog D_{16}, and log M_{16} + colog N_{15}.

6. *On the Extent of the Tables.*

The limits prescribed at the outset for the extent of the tabulated values, as sufficient for practical purposes, were as follows:—For the logarithms, six places, throughout; for D_x and M_x of the Commutation Tables, also six places; for the remaining columns, N_x, S_x and R_x, seven places; for the assurances, six places; and for the annuities, four decimal places. The Elementary Tables were formed by the aid of six-figure logarithms; but for the Commutation Tables and the deductions from them, seven-figure logarithms were used, the whole, logarithms and numbers, being subsequently cut down to the prescribed limits. It may fairly be presumed therefore that the tables thus formed are true in their last figures.

The object in view, in the employment of seven figures, at the cost of considerable enhancement of labour, was the attainment of a greater degree of exactitude than was to be had by the use of six figures. It is well enough known that a result formed by means of logarithms may generally be depended on, subject to an error of a unit or so, to the same number of places as are contained in the logarithms used in its formation; but it is not so well known what degree of exactitude may be looked for in the results of such a series of mixed operations as is required in the formation, for example, of a commutation table.

With a view to throw a little light upon this point, six-figure logarithms only have been employed in the portions of the commutation table given as examples; and comparison of these portions with those corresponding to them in the printed tables, reveals the existence of a few discrepancies of a unit in the last place. But, to obtain a wider field for comparison, Column D, commenced in the example, p. xviii, has been completed on the same basis, Column N has been formed from it, and from those columns, still using the six-figure tables, a table of annuities has been formed.

The following small table shows the result of a careful comparison of the columns formed as just described with the corresponding columns in the tables, these latter being assumed to be correct:—

Errors.	Log D_x	D_x	N_x	a_x	Totals.
0	60	48	50	77	235
1	28	39	33	10	110
2	..	1	3	..	4
3	..	..	1	..	1
	88	88	87	87	350

This means that in log D_x there are 60 values correct, and 28 with an error of ± 1; in D_x, 48 correct, 39 with an error of ± 1, and one with an error of ± 2, and so on; the state of the annuity column being, 77 correct, and 10 with an error of ± 1; that is, in the *fourth* decimal place, *three* only being usually tabulated.

These deviations from strict accuracy will not be considered very great. In order to determine the cost by which the greater exactitude of the tables as printed has been purchased, an experiment was instituted. Three gentlemen, well practised in the use of both the seven and the six-figure tables, kindly lent their aid. Each of them made a certain number of *direct* entries, first in the seven and next in the six-figure tables. A like number of inverse entries was then made, first in the seven and next in the six-figure tables as before; the times occupied being carefully noted in each case. Combination of the results gave the following ratios of the times occupied in the two cases:—

Direct entries . . . . 1 : ·663
Inverse ,, ... 1 : ·615

In both cases the ratio is greater than that of 3 : 2, showing that in each there is a saving in time (to say nothing of the saving in mental effort) of at least one-third, by the use of the six-figure tables, the saving in the case of the inverse operation being the greater of the two.

The practical inference from what precedes is that, where such a degree of exactitude as that which was found to have been attained by the use of six-figure logarithms in the construction of the Commutation Table is judged sufficient for the purpose in hand, it is nothing else than an improvident waste of time and labour to use the seven-figure tables. Had the present investigation been made previous to the construction of the Commutation Tables, and its result known, in all likelihood the employment of seven figures here would not have been thought of.*

7. *Miscellaneous Formations.*

It will be proper now to give, in the form of Problems, some examples of more general formations, those already given having reference to tabulated functions. The differences of the principal logarithmic functions are given in these tables for the first time; and some further justification of this departure from previous usage than has yet been afforded, will perhaps be looked for.

PROBLEM I. To construct the series $\log vp_x$.

This series presents itself as the series of differences of $\log D_x$. It is frequently wanted however when $\log D_x$ has not been formed, as for the construction of a table of annuities,

* There is at present no English six-figure table, *properly so called*, available; which is the reason why the late Professor De Morgan, as he informs us,† on occasions when he suspected five figures to be insufficient, immediately had recourse to a seven-figure table. We have abundance of tables in which the logarithms extend to six places; but as the arguments extend to no more than four, they are more troublesome to use than the seven-figure tables, with a figure fewer in the results. The differences in them range from 434 to 43, and for want of room there are no proportional parts, while there are two figures to be proportioned for. A proper six-figure table, on the other hand, has, like our seven-figure tables, five-figure arguments, and consequently gives five-figure results by inspection; the differences range from 44 to 4, affording ample space for the exhibition of the requisite proportional parts; while, moreover, there is never more than one figure to be proportioned for.

It is hoped that ere long an English Table, with various improvements for facilitating its use, will be available. In the meantime a very good German table, possessing the above-described qualifications, and whose title follows, may be had at a very moderate cost:—*Logarithmisch-trigonometrische Tafeln, mit sechs Decimalstellen. Vox Dr. C. Bremiker.* Berlin, 1869.

† *Penny Cyclopædia*, vol. xxiii, p. 499; and *English Cyclopædia*, Division, *Arts and Sciences*, vol. vii., Col. 1005.

for instance, and therefore the method of its formation will be here shown.

Since $\qquad \log vp_x = \log v + \log p_x,$

therefore, $\qquad \Delta \log vp_x = \Delta \log p_x.$

Hence, $\qquad \log vp_{x+1} = \log vp_x + \Delta \log p_x; \quad . \quad . \quad . \quad . \quad (1)$

and, $\qquad \log vp_x = \log vp_{x+1} + \Delta \operatorname{colog} p_x \quad . \quad . \quad . \quad (2)$

Of the two formulæ deduced (1) is for the direct, and (2) for the reverse formation. The latter is the more convenient for two reasons: first, the series is usually wanted in reverse order; and, secondly, the differences which form the addends in this order, have many fewer significant figures than those that form the addends in the other. An example of each formation is given :—

Log vp_x

Log v	·987163	Log v	·987163
,, p_{10}	·997867	,, p_{96}	·264047
10	·985030	96	·251210
	397		295815
11	·985426	95	·547024
	292		132721
12	·985719	94	·679746
	176		73995
13	·985895	93	·753741
	67		45457
14	·985962	92	·799198
	999952		25087
15	·985913	91	·824284
*	*	*	*
Log v	·987163	Log v	·987163
,, p_{15}	·998751	,, p_{91}	·837122
15	·985914	91	·824285

This series, in whatever way it is to be used, whether in the formation of Column D, or in the construction of a table of annuities, requires correction in consequence of the curtailment of the value of log v, which enters every term. The true value of log v is ·987162,775 . . . ., the values used being ·987163 ; and the correction is the abatement of a unit in the sixth place at the proper points, which may be determined, as already shewn, by reference to a six-figure table of log v^x. The requisite corrections are introduced in the example.

PROBLEM 2. To form a table of loaded assurance premiums.

The formation of ϖ_x has been already exemplified. The present formation differs from that referred to in no other respect than that here the logarithm of (1 *plus* its loading) is included in the initial term.

Thus, to form ϖ_x with a loading of $17\frac{1}{2}$ per-cent. :—

Log 1·175	0·070038	
„ M_{10}	4·298988	
Col. N_9	$\bar{7}$·727862	
10	$\bar{2}$·096888	·012499
	992208	
	17622	
11	·106718	·012785
	993771	
	17732	
12	·118221	·013129
	994922	
	17864	
13	·131007	·013521
*	*	*
Log 1·175	0·070038	
„ M_{13}	4·279889	
Col. N_{12}	$\bar{7}$·781080	
13	$\bar{2}$·131007	

The premiums here formed may be compared with those for the same ages on p. 14.

PROBLEM 3. To form a table of the values of endowments payable at a specified age.

The age at which the endowment becomes payable being $x+n$, the value of the benefit is

$$\frac{D_{x+n}}{D_x};$$

or, in logarithms,

$$\log D_{x+n} + \operatorname{colog} D_x.$$

And the difference of this expression, in which $x+n$ is constant, is

$$\Delta \operatorname{colog} D_x, \text{ or } \operatorname{colog} vp_n.$$

Two examples follow, in which $x+n$ takes the values 21 and 60, respectively.

Values of Endowments.

Payable at 21.			Payable at 60.		
Log D_{21}	4·710940		Log D_{60}	3·999631	
Col. D_{10}	$\bar{5}$·128372		Col. D_{10}	$\bar{5}$·128372	
10	$\bar{1}$·839312	·690736	10	$\bar{1}$·128003	·134277
	14971			14971	
11	·854283	·714962	11	·142974	·138987
	14573			14573	
12	·868856	·739360	12	·157547	·143730
	14281			14281	
13	·883137	·764077	13	·171828	·148535
	14105			14105	
14	·897242	·789300	14	·185933	·153438
	14039			14039	
15	·911281	·815232	15	·199972	·158479
	14086			14086	
16	·925367	·842106	16	·214058	
•	•	•	*	•	•
Log D_{21}	4·710940		Log D_{60}	3·999631	
Col. D_{16}	$\bar{5}$·214427		Col. D_{16}	$\bar{5}$·214427	·164704
16	$\bar{1}$·925367		16	$\bar{1}$·214058	

PROBLEM 4. To form a table of the assurances equivalent to a present value of a unit.

The value of this assurance, when the age is x, is,

$$\frac{D_x}{M_x};$$

the logarithm of which is,

$$\log D_x + \text{colog } M_x.$$

And the difference of this expression is,

$$\log vp_x + \Delta \text{ colog } M_x.$$

The required table may be consequently constructed as follows :—

Assurances whose value is a Unit.

Log D_{10}	4·871628	
Col. M_{10}	$\bar{5}$·701012	
10	0·572640	3·7380
	985029	
	7792	
11	·565461	3·6767
	985427	
	6229	
12	·557117	3·6068
	985719	
	5078	
13	·547914	3·5311
	985895	
	4363	
14	·538172	3·4528
	985961	
	4039	
15	·528172	3·3742
*	*	*
Log D_{15}	4·799659	
Col. M_{15}	$\bar{5}$·728513	
15	0·528172	

The use of such a table as that of which the formation is here exemplified is to facilitate the conversion of a cash bonus into a reversionary bonus.

Example. A policy on (15) has assigned to it a present bonus of 42·375. Find the equivalent reversionary bonus.

$$42·375 \times 3·3742 = 142·982.$$

This table could be very readily formed from the Assurances on p. 14 by means of Colonel Oakes's *Table of Reciprocals.* The method here employed possesses the advantage of giving also the logarithms of the values formed.

PROBLEM 5. To form a complete table of the values of deferred and temporary annuities.

By a *complete* table is to be understood a table, that shall comprise, in regard to the classes of annuities specified, all the cases that can present themselves in the use of the mortality table employed.

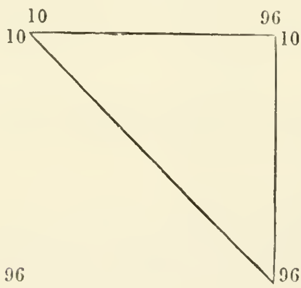
The present age, (or, preferably, the age to which the value to be formed has reference,) being as usual x, denote that at which the deferred annuity is to be entered upon, and the corresponding temporary annuity to cease, by y. Then, the value of the deferred annuity being

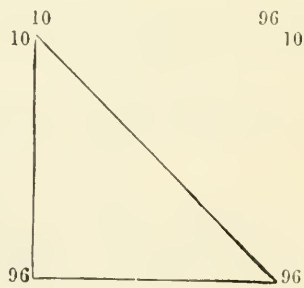
$$\frac{N_y}{D_x},$$

of which the logarithm is,

$$\log N_y + \text{colog}\, D_x,$$

we shall have to form the values of this expression for all the combinations of x and y, in which x does not exceed y. This can be very commodiously done in a series of paralel collumns. Either of the quantities x and y, as may be arranged, will vary in the columns; and the other will vary in passing from column to column, that is in the rows. If, as is most convenient, it is chosen to commence with the younger ages, the work will assume one or other of the following forms:—The first, if in the columns x be made to vary, and the second, if y be made to vary:—





The forms are theoretically equally eligible. The first, however, is to be preferred, because in it the addends will consist of fewer significant figures than in the second: Δ colog D_x contains generally only five significant figures, while Δ log N_y contains six throughout.

The following is a specimen of the formation, in which the values of y are at the top and those of x at the side.

Formation of Deferred and Temporary Annuities.

	10		11		12	
		24·1484		24·1484		24·1484
10	382888	24·1484	365156	23·1823	347292	22·2480
			14971	0·9661	14971	1·9004
				23·9953		23·9953
11			380127	23·9953	362263	23·0284
					14573	0·9669
						23·8142
12					376836	23·8142

Formation—(continued).

	13		14		15	
		24·1484		24·1484		24·1484
10	329276	21·3440	311094	20·4688	292735	19·6216
	14971	2·8044	14971	3·6796	14971	4·5268
		23·9953		23·9953		23·9953
11	344247	22·0926	326065	21·1868	307706	20·3098
	14573	1·9027	14573	2·8085	14573	3·6855
		23·8142		23·8142		23·8142
12	358820	22·8465	340638	21·9098	322279	21·0029
	14281	0·9677	14281	1·9044	14281	2·8113
		23·6103		23·6103		23·6103
13	373101	23·6103	354919	22·6422	336560	21·7050
			14105	0·9681	14105	1·9053
				23·3897		23·3897
14			369024	23·3897	350665	22·4215
					14039	0·9682
						23·1581
15					364704	23·1582

The first six columns are here given complete. The initial terms are the successive values of $\log N_y + \operatorname{colog} D_x$, when y is made to vary; and they are formed as follows, the addends being the terms of $\Delta \log N_y$:—

Log N_{10}	6·254516
Col. D_{10}	$\bar{5}$·128372
10	1·382888
	982268
11	·365156
	982136
12	·347292
	981984
13	·329276
	981818
14	·311094
	981641
15	·292735
*	*
Log N_{15}	6·164363
Col. D_{10}	$\bar{5}$·128372
15	1·292735

In the columns, x being the variable, the addends are, as already intimated, the terms of Δ colog D_x, or colog vp_x, commencing in each column with colog vp_{10}, and continued till the next value of x at the side is the same as the value of y at the top. The addends having been written down, it is well before proceeding to the additions to form series for verifications of the several columns at suitable intervals. These will be formed in the same way as the series of initial terms. The following is an example for $x=12$:—

Log N_{12}	6·218920
Col. D_{12}	$\bar{5}$·157916
12	1·376836
	981984
13	·358820
	981818
14	·340638
	981641
15	·322279
*	*
Log N_{15}	6·164363
Col. D_{12}	$\bar{5}$·157916
15	1·322279

The verification values being inserted in their places the addition is proceeded with. A final verification is had at the close, the last sum in each column being the logarithm of the whole-life annuity on the age at the top and also at the side. The manner of forming these logarithms has been already shown (p. xxiv).

To pass now to the columns of numbers. It will be observed that in each column the lines next above the values of the deferred annuities are occupied by terms of the series of whole-life annuities (from p. 14), commencing, in each column, with the annuity corresponding to the age opposite, viz., 10, and ending with that corresponding to the age at the top.

Subtraction now gives the values of the complementary annuities ; *i. e.*, the temporary annuities which, together with the deferred annuities that form the subtrahends, are equal to the corresponding whole-life annuities that form the minuends.

The two sets of results may be arranged in a table of the following form :—

Values of Deferred and Temporary Annuities.

	10	11	12	13	14	15	
10	——	23·1823	22·2480	21·3440	20·4688	19·6216	10
1	·9661	——	23·0284	22·0926	21·1868	20·3098	1
2	1·9004	·9669	——	22·8465	21·9098	21·0029	2
3	2·8044	1·9027	·9677	——	22·6422	21·7050	3
4	3·6796	2·8085	1·9044	·9681	——	22·4215	4
16	4·5268	3·6855	2·8113	1·9053	·9682	——	16
*	*	*	*	*	*	*	*

The horizontal lines separate the deferred from the temporary annuities, the former occupying the portion of the table above the lines, and the latter the portion below.*

For the deferred annuities, the present ages are at the side, and the ages at which the annuities are respectively to

* The spaces occupied by the horizontal lines might be legitimately occupied by the whole-life annuities. But these are already given elsewhere, and the lines more effectually serve the the purpose of separators.

be entered upon are at the top. Thus, the value of an annuity on (12), to be entered upon at 15, is 21·0029, and so on.

For the temporary annuities, the present ages are at the top, and the ages at which the annuities are respectively to cease, are at the side. Thus, the value of an annuity on (12) to last three years, and consequently to cease at 15, is 2·8113.

These two annuities being complementary, their sum, 23·8142, is the value of the whole-life annuity at 12. Inspection will show how the values formed in the example arrange themselves in the table.

The values in the two portions of the table are related as follows:—Take 12, 12, for example; the values that follow vertically from this point, are respectively complementary to those that follow horizontally. Thus, the sums of the pairs,

22·8465 + ·9677,
21·9098 + 1·9044,
21·0029 + 2·8113,

are each equal to 23·8142, which is the value of the whole-life annuity at 12.

Deferred annuities in which the period of deferment is the same, say n years, are to be found ranging diagonally downwards, commencing opposite x, and under $x+n$. Thus the series of annuities deferred *three* years, $(n=3)$ are 21·3440, 21·1868, 21·0029, &c.

In like manner temporary annuities, whose duration is the same, n years, are also found, in their own compartment of the table, ranging diagonally downwards, commencing under x and opposite $x+n$. Thus, the annuities to last *three* years are 2·8044, 2·8085, 2·8113, &c. And the annuities in these two sets are complementary, each to each; since the initial value of x is the same in both sets, and also the value of n.

Finally, it may be mentioned that the foregoing table, if completed, would occupy exactly the same space as one of the Two-Life Tables, namely 30 pages.

It is obvious that such a table as that just described would be of much utility for the formation of temporary premiums, which are frequently required in the case of endowments and other benefits.

PROBLEM 6. To construct a table of the values of policies.

The value of a policy of assurance is the excess of the value of the sum assured over that of the premium.

The sum assured being a unit, and the premium P_y, where y is the age at which the policy was effected; then, the present age being x, the value of the policy is,

$$*V_{y|x-y} = \frac{M_x - P_y N_{x-1}}{D_x}$$

$$= \frac{D_x - (1-v)N_{x-1} - P_y N_{x-1}}{D_x}$$

$$= 1 - (1 - v + P_y)\frac{N_{x-1}}{D_x}.$$

Putting for $\frac{N_{x-1}}{D_x}$ its value, $1 + a_x$, and denoting $(1 - v + P_y)$ by Q_y, this expression may be conveniently written,

$$1 - Q_y(1 + a_x) \dots\dots\dots\dots\dots (1)$$

To construct the required table then we shall have first to form the values of $Q_y(1 + a_x)$ for every combination of x and y in which x is not less than y, and then to subtract the individual results from unity. The formation here requisite, is entirely analogous to that in Problem 5. In both it is similar series of the products of two factors that have to be formed. There, however, the logarithms of the factors were given, while here their determination is a preliminary part of the process.

The premium P_y may be either the pure premium, that is the premium at the age y given by the table used in the valuation; or it may be the office premium, in its integrity, or any how modified. There are thus two cases, which will be dealt with separately.

* The usual symbol for the value of a policy is $V_{x|n}$, where x is the age at which the assurance was effected, and n the number of years since elapsed. This is at variance with the convention by which x represents the present age. For this reason, and to facilitate the investigation, the symbol is here modified as in the text.

Case I. Let P_y be the pure premium at age y. Then

$$P_y = \varpi_y = \frac{M_y}{N_{y-1}}$$
$$= \frac{D_y - (1 - v) N_{y-1}}{N_{y-1}}$$
$$= \frac{D_y}{N_{y-1}} - (1 - v)$$
$$= \frac{1}{1 + a_y} - (1 - v).$$

Substituting this in Q_y, (1) becomes,

$$1 - \frac{1 + a_x}{1 + a_y} \quad . \; . \; . \; . \; . \; . \; . \; . \; . \; (2);$$

and the preliminary operation here will be the formation of $\log(1 + a_x)$, which will give us also $\text{colog}(1 + a_y)$, since y takes no values different from those taken by x.

A specimen of this preliminary formation follows :

	$\text{Log}(1+a_x)$	Δ	$\text{Colog}(1+a_y)$	Δ
*Log N_9	6·272138			
Col. D_{10}	$\bar{5}$·128372			
10	1·400510	997349	$\bar{2}$·599490	002651
	982378			
	14971			
11	·397859	996841	·602141	003159
	982268			
	14573			
12	·394700	996417	·605300	003583
	982136			
	14281			
13	·391117	996089	·608883	003911
	981984			
	14105			
14	·387206	995857	·612794	004143
	981818			
	14039			
15	·383063	995727	·616937	004273
	981641			
	14086			
16	·378790		·621210	
*	*	*	*	*
Log N_{15}	6·164363			
Col. D_{16}	$\bar{5}$·214427			
16	$\bar{1}$·378790			

* See page xxiv.

After the examples already given, the above does not seem to require explanation. The addends are $\Delta \log N_{x-1} + \Delta \operatorname{colog} D_x$.

Observing that $\Delta \operatorname{colog} (1 + a_y)$ contains fewer significant figures than $\Delta \log (1 + a_x)$, y, in the construction, is made to vary in the columns; x, therefore, will vary in the rows, and the initial terms will be formed as follows:—

Log $(1 + a_{10})$	$\bar{1}$·400510
Col. "	$\bar{2}$·599490
10	0·000000
	997349
11	·997349
	996841
12	·994190
	996417
13	·990607
	996089
14	·986696
	995857
15	·982553
*	*
Log $(1 + a_{15})$	$\bar{1}$·383063
Col. $(1 + a_{10})$	$\bar{2}$·599490
15	$\bar{1}$·982553

A specimen of the formation, consisting of the first six columns, is now given, in which the values of x are at the top and those of y at the side.

Formation of the Values of Policies.

	10		11		12	
10	000000	1·00000 ·00000	997349 2651	·99391 ·00609	994190 2651	·98671 ·01329
11			000000	1·00000 ·00000	996841 3159	·99275 ·00725
12					000000	1·00000 ·00000

Formation—(continued).

	13		14		15	
10	990607 2651	·97860 ·02140	986696 2651	·96983 ·03017	982553 2651	·96062 ·03938
11	993258 3159	·98460 ·01540	989347 3159	·97577 ·02423	985204 3159	·96650 ·03350
12	996417 3583	·99178 ·00822	992506 3583	·98289 ·01711	988363 3583	·97356 ·02644
13	000000	1·00000 ·00000	996089 3911	·99103 ·00897	991946 3911	·98163 ·01837
14			000000	1·00000 ·00000	995857 4143	·99051 ·00949
15					000000	1·00000 ·00000

The logarithmic operation may be verified from point to point as in last problem. The following is the verification of the row in which $y = 12$.

Log $(1 + a_{12})$		1·394700
Col.	,,	$\bar{2}$·605300
	12	0·000000
		996417
	13	·996417
		996089
	14	·992506
		995857
	15	·988363
Col. $(1 + a_{12})$		$\bar{2}$·605300
Log $(1 + a_{15})$		1·383063
	15	$\bar{1}$·988363

A final verification is had at the close of the work, the last sum in each column being ·000000, which is what $\log(1 + a_x) + \text{colog}(1 + a_y)$ becomes when $x = y$.

When the numbers corresponding to the several logarithmic series have been taken out, and their complements to unity formed, these last, which are the policy values required, may be abstracted and arranged in a table in either of the following forms :—

Values of Policies.—Form No. 1.

y	10	11	12	13	14	15	
10	·00000	·00609	·01329	·02140	·03017	·03938	10
11		·00000	·00725	·01540	·02423	·03350	11
12			·00000	·00822	·01711	·02644	12
13				·00000	·00897	·01837	13
14					·00000	·00949	14
15						·00000	15

Values of Policies.—Form No. 2.

x	10	11	12	13	14	15	
10	·00000						10
11	·00609	·00000					11
12	·01329	·00725	·00000				12
13	·02140	·01540	·00822	·00000			13
14	·03017	·02423	·01711	·00897	·00000		14
15	·03938	·03350	·02644	·01837	·00949	·00000	15
*	*	*	*	*	*	*	*

In the first form the present ages are at the top, and the ages at which the policies were severally effected are at the side; in the second form the ages are interchanged, the present ages being at the side, and the others at the top. In both cases, the difference between the two ages to which a specified value corresponds, is the number of years that the policy whose value is in question has been in force.

The second form seems, on the whole, the preferable one. But whichever is chosen, a large portion of the columns will be left blank. The blanks might be filled by the values of some other function, say the logarithms of the policy values; and the two sets of functions might be rendered more distinguishable by being written in differently coloured ink, or, if printed, by being set up in different type, as in the Two-Life Tables of the present volume.

The table, if completed as suggested, would occupy thirty pages.

Case 2. Let P_y be the office premium, or any modification of it.

It was found in the last Case that Q_y, or $1 - v + P_y$, reduced to $(1 + a_y)^{-1}$, so that the expression for the policy value assumed the form

$$1 - \frac{1 + a_x}{1 + a_y}.$$

In the present Case Q_y admits of no such simplification; and therefore the expression here to be dealt with is

$$1 - Q_y (1 + a_x),$$

in which $Q_y = 1 - v + P_y$, and P_y has a given value. The negative portion of the expression is, however, of the same form as the corresponding portion of the expression in the first Case, and the mode and form of its construction will be analogous.

The preliminary formation here will be, since $\log (1 + a_x)$ is already formed, that of $\log Q_y$, which, in practical applications, will be a very easy matter, since P_y for all ages will be given. For the present purpose, however, it is necessary to form P_y. Premising that we assume for this the pure premium loaded to the extent of ten per-cent,* the formation can be easily conjoined with that of $\log Q_y$, as follows:—

	Log P_y	P_y and Q_y	Log Q_y	Δ	
Log 1·10	0·041393				
,, M_{10}	4·298988	$\boxed{\cdot 029126}$			
Col. N_9	$\bar{7}$·727862				
10	$\bar{2}$·068243	·011702			
	992208	·040828	$\bar{2}$·610958	002831	10
	17622				
11	·078073	·011969			
	993771	·041095	·613789	003390	11
	17732				
12	·089576	·012291			
	·994922	·041417	·617179	003831	12
	17864				
13	·102362				

* Ten per-cent. will be considered but a small loading for an office premium. It serves our present purpose, however, as will be seen presently, better than a heavier one.

13	·102362 995637 18016	·012658 ·041784	·621010	004179	13
14	·116015 995961 18182	·013062 ·042188	·625189	004435	14
15	·130158 995896 18359	·013495 ·042621	·629624	004561	15
16	·144413	·013945 ·043071	·634185		
*	*	*	*	*	*

Log 1·10	0·041393
„ M_{16}	4·267383
Col. N_{15}	$\bar{7}$·835637
16	$\bar{2}$·144413

The above needs little explanation. Log $P_y = \log (1\cdot10 M_y) + \operatorname{colog} N_{y-1}$, is first formed, the addends being $\Delta \log M_y$ and $\Delta \operatorname{colog} N_{y-1}$. The numbers being taken out are each increased by $1 - v = \cdot029126$, thus forming Q_y. The logarithms of Q_y and their differences complete this preliminary formation.

The following shows the construction of the first six columns of the final formation, the values of x being as before at the top, and those of y at the side.

Formation of the Values of Policies.

	10		11		12	
	400510 610958		397859 610958		394700 610958	
10	011468	1·02676 — ·02676	008817 2831	1·02051 — ·02051	005658 2831	1·01311 — ·01311
11			011648	1·02718 — ·02718	008489 3390	1·01973 — ·01973
12					011879	1·02773 — ·02773

Formation—(continued).

	13		14		15	
	391117		387206		383063	
	610958		610958		610958	
10	002075	1·00479	998164	·99578	994021	·98633
	2831	— ·00479	2831	·00422	2831	·01367
11	004906	1·01136	000995	1·00229	996852	·99278
	3390	— ·01136	3390	— ·00229	3390	·00722
12	008296	1·01929	004385	1·01015	000242	1·00056
	3831	— ·01929	3831	— ·01015	3831	— ·00056
13	012127	1·02832	008216	1·01910	004073	1·00942
		— ·02832	4179	— ·01910	4179	— ·00942
14			012395	1·02895	008252	1·01918
				— ·02895	4435	— ·01918
16					012687	1·02964
						— ·02964

The only point in respect of which the logarithmic part of this formation differs from that in Case 1 is, that here the addends are the differences of log Q_y. The operation may be verified horizontally at any point, as in Case 1; but we have not here the final verification that we have there. The last sum in each column is no longer 0: it is necessary, therefore, to form a series consisting of the terminal values of the several columns in order. This may be done as follows:—

	Log $[Q_y(1+a_x)]$ $(x=y)$
Log $(1+a_{10})$	$\bar{1}$·400510
„ Q_{10}	$\bar{2}$·610958
10	0·011468
	997349
	2831
11	·011648
	996841
	3390
12	·011879
	996417
	3831
13	·012127
	996089
	4179
14	·012395

14	·012395
	995857
	4435
15	·012687
*	*
$\operatorname{Log}(1+a_{15})$	1·383063
,, Q_{15}	$\bar{2}$·629624
15	0·012687

Both x and y here vary: the addends, therefore, are $\Delta \log (1+a_x)$ and $\Delta \log Q_y$; and the terms thus formed should be inserted in their places at the outset.

It will be observed that, with the exception of three, the policy values here formed are all negative; and a very slight addition to the loading would have rendered the three exceptions negative also. With so small a loading as ten per-cent. a policy effected at 10 has no positive value till 14, when it is worth just one penny. Yet there are not wanting those who maintain that every policy, whatever may be its duration, has, or ought to have, a surrender value; and that, consequently, the abandonment of a policy, under whatever circumstances, is a source of profit to the office.

II. Of the Two-Life Tables.

The Two-Life Tables in the present volume comprise, first a complete set of the values of annuities on the joint duration of two lives, at each of the rates, three, three-and-a-half and four per-cent.; and, secondly, a similar set of annuity values, and at the same rates, on the last survivor of two lives. These, as has been already intimated, have been deduced from the $\mathbf{H^M}$ table.

The two classes of tables will be treated in order; and, as before, the illustrations will have reference to the rate of three per-cent.

1. *Of the Joint-Life Tables.*

The tables were constructed by aid of the well-known formula,

$$a_{x\cdot y}=vp_{x\cdot y}(1+a_{x+1\cdot y+1});$$

which is very simply deduced as follows :—

The annuity on (xy) consists of two portions, that having reference to the first year, and that having reference to all the years after the first, of the possible joint duration of (x) and (y).

The value of the first portion is $vp_{x\cdot y}$ and that of the second portion is $vp_{x\cdot y}\,a_{x+1\cdot y+1}$; whence the total value is,

$$a_{x\cdot y}=vp_{x\cdot y}(1+a_{x+1\cdot y+1});$$

or, in logarithms, $\log a_{x\cdot y}=\log vp_{x\cdot y}+\log(1+a_{x+1\cdot y+1})$.

For the application of this formula we want the values of $\log vp_{x\cdot y}$ for the requisite combinations of x and y. These are, if for convenience we make x the older age, the combinations in which each value of x is connected in succession with all the values of y that do not exceed it. The formation of the values of this function was, therefore, the first step ; and the following is a type of the arrangement adopted :—

$x-y$	96	95	94	93
0	96·96	95·95	94·94	93·93
1	96·95	95·94	94·93	93·92
2	96·94	95·93	94·92	93·91
*	*	*	*	*
*	*	*	*	*
84	96·12	95·11	94·10	
85	96·11	95·10		
86	96·10			

The values of x are at the top, and those of $x-y$ at the side. The former proceed from 96 to 10, and the latter from 0 to 86. Hence x is constant in the columns, and $x-y$ is constant in the rows. It is the fulfilment of this latter condition that has been mainly kept in view in devising the arrangement. It is the series in which $x-y$ is constant that are wanted in the final construction ; and they are most conveniently abstracted when formed in rows.

The following is a portion of the actual formation :—

Formation of $Log\, vp_{x\cdot y}$.

$x-y$	96	95	94	93	92	91
0	515256 295815	106887 132721	372329 73995	520319 45457	611232 25087	661408 20541
1	811071 132721	239608 73995	446324 45457	565776 25087	636319 20541	681949 15543
2	943792 73995	313603 45457	491781 25087	590863 20541	656860 15543	697492 8008
3	017787 45457	359060 25087	516868 20541	611404 15543	672403 8008	705500 4583
4	063244 25087	384147 20541	537409 15543	626947 8008	680411 4583	710083 6490
5	088331 20541	404688 15543	552952 8008	634955 4583	684994 6490	716573 5402
6	108872	420231	560960	639538	691484	721975
*	*	*	*	*	*	*
*	*	*	*	*	*	*
80	249797 163	545776 48	678545 999933	752473 999824	797753 999708	822550 999603
81	249960 48	545824 999933	678478 299824	752297 999708	797461 999603	822153
82	250008 999933	545757 999824	678302 999708	752005 999603	797064	
83	249941 999824	545581 999708	678010 999603	751608		
84	249765 999708	545289 999603	677613			
85	249473 999603	544892				
86	249076					

The construction was effected as follows. The function to be formed is $\log vp_{x\cdot y}$, which is equal to

$$\log v + \log p_x + \log p_y\,;$$

and, connecting the constant, $\log v$, with $\log p_x$, it will be written thus,

$$\log vp_x + \log p_y.$$

Now if in this expression both x and y vary, as in the rows, we have,

$$\Delta_{x\cdot y} \log vp_{x\cdot y} = \Delta \log vp_x + \Delta \log p_y ; \quad . \ . \ . \quad (1.)$$

if y alone vary, as in the columns, we have,

$$\Delta_y \log vp_{x\cdot y} = \Delta \log p_y ; \quad . \ . \ . \ . \ . \ . \ . \quad (2.)$$

and if x alone vary, as in ascending diagonally, we have,

$$\Delta_x \log vp_{x\cdot y} = \Delta \log vp_x \quad . \quad . \ . \ . \ . \ . \quad (3.)$$

From (1) we get, for construction of the initial and verification series, in the rows, proceeding from left to right,

$$\log vp_{x\cdot y} = \log vp_{x+1\cdot y+1} + \Delta \operatorname{colog} vp_x + \Delta \operatorname{colog} p_y ;$$

from (2), for the principal formation in the columns,

$$\log vp_{x\cdot y} = \log vp_{x\cdot y+1} + \Delta \operatorname{colog} p_y ;$$

and from (3), for the construction of the series of terminal values,

$$\log vp_{x\cdot y} = \log vp_{x+1\cdot y} + \Delta \operatorname{colog} p_x .$$

The following are examples of the application of the first and third formulæ:—

Initial Values.

$x-y=0$	
Log vp_{96}	$\bar{1}$·251209
,, p_{96}	$\bar{1}$·264047
96·96	$\bar{2}$·515256
	295816
	295815
95·95	$\bar{1}$·106887
	132721
	132721
94·94	·372329
	73995
	73995
93·93	·520319
	45456
	45457
92·92	·611232
	25089
	25087
91·91	·661408
*	*
Log vp_{91}	$\bar{1}$·824286
,, p_{91}	$\bar{1}$·837122
91·91	$\bar{1}$·661408

Verifications.

$x-y=6$	
Log vp_{96}	$\bar{1}$·251209
,, p_{90}	$\bar{1}$·857663
96·90	$\bar{1}$·108872
	295816
	15543
95·89	·420231
	132721
	8008
94·88	·560960
	73995
	4583
93·87	·639538
	45456
	6490
92·86	·691484
	25089
	5402
91·85	·721975
*	*
Log vp_{91}	$\bar{1}$·824286
,, p_{85}	$\bar{1}$·897689
92·85	$\bar{1}$·721975

Terminal Values.	
Log vp_{96}	$\bar{1}$·251209
,, p_{10}	$\bar{1}$·997867
96·10	$\bar{1}$·249076
	295816
95·10	·544892
	132721
94·10	·677613
	73995
93·10	·751608
	45456
92·10	·797064
	25089
91·10	·822153
*	*
Log vp_{91}	$\bar{1}$·824286
,, p_{10}	$\bar{1}$·997867
91·10	$\bar{1}$·822153

As appears by the formulæ the differences are here used in reverse order. Theoretically Δ colog vp_x is the same thing as Δ colog p_x, since v is constant. Practically, however, in consequence of the unavoidable inaccuracy in log v, these functions will occasionally differ by a unit (sometimes two); and therefore, since Δ colog vp_x is not tabulated, in using Δ colog p_x in its stead, the last figure must be corrected, by reference to the column colog vp_x, pp. 10, 12, before proceeding to the additions.* The corrected figures are here printed in different type.

The main formation illustrates the application of the second of the foregoing formulæ, and the whole of the results just obtained will be found in their places in the portion of it given on p. xlvii.

It will be observed that it is the same series, colog p_y, (in reverse order,) that forms the addends in all the columns; and consequently, when it has been inserted in the first column, it was an easy matter to transfer it thence to the other columns in succession.

It may be mentioned that after the initial and two or three verification series had been inserted, the entire formation of this function did not occupy more than twelve hours.

A specimen of the annuity construction occupies the following two pages, and to it we now refer.

The arrangement is here obvious from the indications at the tops of the columns and at the side. In the columns $x-y$ is constant, which is necessitated by the requirements of the working formula, and y, the younger of the two ages, is constant in the rows. The result of the arrangement is that the values which are to occupy the rows in the table in its final form are here formed also in rows.

* See page xxviii.

* *Formation of $a_{x \cdot y}$.*

y	$x-y=0$		$x-y=1$		$x-y=2$	
96	515256	·0328				
	106887					
	013989					
	8					
95	120884	·1321	811071	·0647		
	372329		239608			
	053873		027233			
	9		64			
94	426211	·2668	266845	·1849	943792	·0879
	520319		446324		313603	
	102711		073660		036509	
	2		7		64	
93	623032	·4198	519991	·3311	350176	·2240
	611232		565776		491781	
	152215		124196		087754	
	9		23		14	
92	763456	·5800	689995	·4898	579549	·3798
	661408		636319		590863	
	198647		173089		139801	
	21		31		14	
91	860076	·7246	809439	·6448	730678	·5379
*	*	*	*	*	*	*

The same.

y	$x-y=81$		$x-y=82$		$x-y=83$	
15	249960	·1778				
	545824					
	071067					
	9					
14	616900	·4139	250008	·1778		
	678478		545757			
	150420		071082			
	0		1			
13	828898	·6744	616840	·4138	249941	·1778
	752297		678302		545581	
	223812		150391		071067	
	39		12		6	
12	976148	·9466	828705	·6741	616654	·4137
	797461		752005		678010	
	289244		223772		150332	
	24		2		16	
11	086729	1·2210	975779	·9458	828358	·6735
	822153		797064		751608	
	346540		289050		223611	
	16		39		23	
10	168709	1·4747	086153	1·2194	975242	·9446

* The terminal portions of these six (double) columns is given hereafter, pp. lxiv and lxv.

Formation of $a_{x \cdot y}$.—(continued.)

y	$x-y=3$		$x-y=4$		$x-y=5$	
93	017787	·1042				
	359060 043032 8					
92	402100	·2524	063244	·1157		
	516868 097745 0		384147 047534 4			
91	614613	·4117	431685	·2702	088331	·1226
*	*	*	*	*	*	*

The same.

y	$x-y=84$		$x-y=85$		$x-y=86$	
12	249765	·1777				
	545289 071037 10					
11	616336	·4134	249473	·1776		
	677613 150244 11		544892 070991 11			
10	827868	·6728	615894	·4129	249076	·1775

The initial terms are formed as follows. In the equation

$$a_{x \cdot y} = vp_{x \cdot y}(1 + a_{x+1 \cdot y+1}),$$

if x is 96, (the next to the oldest tabular age,) $a_{x+1 \cdot y+1}$ vanishes, and we get

$$a_{96 \cdot y} = vp_{96 \cdot y};$$

whence

$$\log a_{96 \cdot y} = \log vp_{96 \cdot y}.$$

From this it appears that the initial terms of the several columns are the terms of the series $\log vp_{x \cdot y}$ which occupy the first column, (that headed 96,) in the formation on page xlvii. The initial terms being then inserted in their places, each is followed, in its own column, by the succeeding terms of the series, ($x-y$ constant,) of which it forms the leading term.

The logarithmic operation now commences; and the first column, ($x-y=0$,) is referred to for illustration. As shewn by the working formula, the chief part of this operation consists in the formation of $\log(1+a_{x \cdot y})$ from $\log a_{x \cdot y}$, which is known. This of course can be done by aid of the common logarithm tables, used first inversely and next directly. But it can be done much more easily by the use of Table I. in Gray's *Tables and Formulæ;* which table, giving the values of $\log(1+x)$ corresponding to successive values of $\log x$, enables us, by a single direct entry, to pass at once from the given to the required logarithm. The operation was conducted, therefore, by means of this table.

The method of proceeding is so simple as hardly to need explanation. The table is entered with the initial term $\bar{2}\cdot515256$, which is the logarithm of $a_{96 \cdot 96}$, and the result $\cdot013989+8$, (8 being the pro-parts,) is set down as shewn. Addition then gives the annuity value on the next younger combination, (95·95). Here, observing that 120884 is less than 515256, we know that an increase of a unit has taken place in the index. The next entry accordingly is made with $\bar{1}\cdot120884$, and an operation similar to that just described gives

$\log a_{94\cdot 94}$, and so on. Having always sufficient warning of an increase in the index by the decrease that at the same point takes place in the mantissa, it is found to be unnecessary to set down the indices, whereby some writing, as well as space, is saved.

The operations in the remaining columns being in all respects similar to those in the first it is not necessary further to refer to them. From and after column 4, ($x-y=3$,) the index of the initial term is $\bar{1}$, and in none of them does a change take place till a considerable number of terms has been formed.

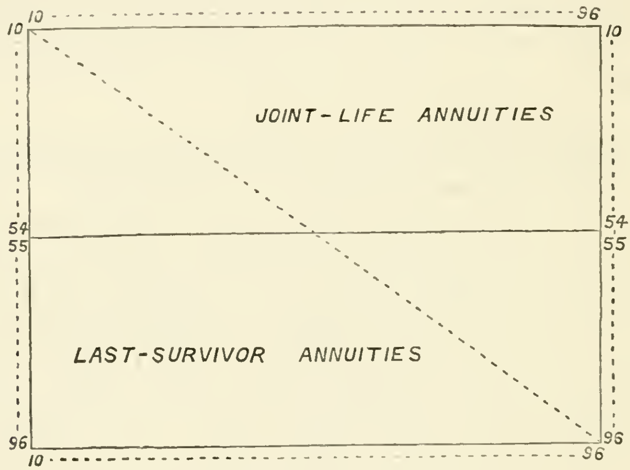
When the logarithmic part of the operation has been completed there remains the taking out of the numbers. It has been usual heretofore to tabulate annuity values to three decimal places only. It is, however, now well enough understood that such annuity values "are not sufficiently exact for survivorship questions, the results of which depend on the differences of nearly equal annuities"*; and therefore it was determined that the annuity values in the present volume should be given to four decimal places. The additional labour involved in this determination is very small indeed. So long as the values do not exceed 10 the numbers can be obtained to the required extent by inspection, by the use of the common seven-figure tables, or Bremiker's six-figure table. For values from 10 to 20 we can now also obtain them by inspection by the use of Mr. Sang's recently published seven-figure table. In this table the numbers extend to 200,000; and therefore in the portion from 100,000 to 200,000 the argument consists of six places. It is consequently in only the comparatively small number of cases in which the value of the joint-life annuity exceeds 20, that interpolation in taking out the numbers is necessary; and, as only one figure has in those cases to be interpolated for, if Bremiker's

* De Morgan, *Companion to The Almanac*, 1842, p. 7; and *Journal of the Institute*, vol. xiii. p. 136.

table be used for the purpose the operation is a very easy one.

There will thus be small excuse for the restriction of annuity tables that may hereafter be published to three decimal places.

The following diagram will aid in the comprehension of the final arrangement of the results :—



There are two sets of results to be provided for, the joint-life annuities and the last-survivor annuities. They are of the same extent, each requiring for its proper display a triangular space. These are combined, therefore, as shewn in the diagram, the joint-life annuities occupying the upper triangle and the last-survivor annuities the lower. To distinguish the two—although the distinction is hardly needed—the two sets of annuities are printed in different type; and they are separated from each other in the several columns by horizontal lines. The pages not being of sufficient depth to receive the whole series of ages from 10 to 96, the quadrangular space is divided horizontally into two, of which the first, (of the three-per-cent table,) occupies pp. 141 to 155, and the second pp. 156 to 170. To facilitate the following out of any of the columns numbers are placed at the bottom of the pages, which in the first part, pp. 141 to 155, refer to the pages where the remaining portions of the columns thus indicated are to be found; and in the second part, pp. 156 to 170, the references are to the pages where the preceding portions of the several columns are to be found.

The directions at the bottom of the several pages of the table, will be found, after a little practice, quite sufficient to enable the annuity, whether joint-life or last-survivor, on any specified combination of ages, to be readily found.

There being no room in this arrangement for the annuities on the combinations in which the ages are equal, these are disposed by themselves in a separate table on page 140.

To ensure accuracy in the results, in the absence of columns D and N for two lives, the annuity construction was conducted in duplicate, by independent computers. Two sets of books, properly ruled, were prepared, in each of which the terms of the preliminary series, $\log vp_{x \cdot y}$, were entered, and carefully compared. The operation then proceeded simultaneously in both sets, comparison being made from point to point, and discrepancies, revealing the existence of error, traced to their sources and removed, till the whole was completed.*

The numbers were afterwards taken out in both sets of books, and carefully compared throughout; and it is hoped that, as a result of the care exercised, no error of any consequence will be found to have escaped detection.

It may be of use to mention that the two sets of annuity values formed on pp. l and li, will be found in their places in the printed table, those formed in the first specimen on pp. 169 and 170, and those formed in the second on pp. 154 and 155.

* In point of fact, owing to the care exercised in this part of the work, and the simplicity of the operation, very few errors were committed. In one set of the books—the first that comes to hand—the errors committed in the logarithmic process appear to have been just five, being on an average one error in 765 operations. It may be noted also, that the computer in this case was a gentleman who, although an expert arithmetician, had no previous practice in the use of mathematical tables.

And it will be observed that, as already intimated, the values which occupy the rows in the formations on pp. l and li, take their places also in rows in the printed table.

It will be well, before leaving the subject of the Joint-Life Tables, to give a few examples of their applications.

Example 1. Find the value of an annuity on (48·36) to be entered upon in 15 years.

$$(48\cdot36)+15=(63\cdot51)$$

The formula is,

$$_{n|}a_{x\cdot y}=v^n\cdot{}_np_{x\cdot y}a_{x+n\cdot y+n},$$

which in the present case becomes,

$$_{15|}a_{48\cdot36}=v^{15}\cdot{}_{15}p_{48\cdot36}a_{63\cdot51}.$$

In applying the formula we use the equality,

$$v^{15}\cdot{}_{15}p_{48\cdot36}=\frac{D_{63}}{D_{48}}\cdot\frac{l_{51}}{l_{36}}.$$

P. 149	$a_{63\cdot51}$	7·6716	log 0·884886
12	D_{63}	. . . .	,, 3·918585
10	D_{48}	. . . .	col. $\bar{5}$·741519
2	l_{51}	. . . .	log 4·854707
,,	l_{36}	. . . .	col. $\bar{5}$·067912
	$_{15|}a_{48\cdot36}$	2·9350	log 0·467609
	$_{|15}a_{48\cdot36}$	4·7366	

The required deferred annuity is thus 2·9350; and the corresponding temporary annuity, formed by subtraction, is 4·7366.

Example 2. Find the value of an assurance of a unit on (37·30).

The formula is,

$$A_{x\cdot y}=1-(1-v)(1+a_{x\cdot y});$$

which in the present case becomes,

$$A_{37\cdot30}=1-(1-v)(1+a_{37\cdot30}).$$

P. 145	$1+a_{37\cdot30}$	16·3553	log 1·213659
238	$1-v$	. . . .	,, $\bar{2}$·464284
		·476368	,, $\bar{1}$·677943
	$A_{37\cdot30}$	·523632	

The logarithm of the divisor for the annual premium, (payable till the first death,) is in the process; and hence the premium may be readily determined.

It will be unnecessary to have recourse to the foregoing process, when Orchard's Tables are at hand. These give at once ·52364.

Example 3. Required the value of a survivorship assurance of a unit on (65) against (37).

The formula here is, (Milne, p. 184,)

$$A^{1}_{\overline{x.y}} = \tfrac{1}{2}\left(A_{x\cdot y} + \frac{a_{x-1\cdot y}}{p_{x-1}} - \frac{a_{x\cdot y-1}}{p_{y-1}}\right);$$

and in the present case it becomes,

$$A^{1}_{\overline{65.37}} = \tfrac{1}{2}\left(A_{65\cdot37} + \frac{a_{64\cdot37}}{p_{64}} - \frac{a_{65\cdot36}}{p_{36}}\right);$$

P. 150	$1+a_{65\cdot37}$	8·7779	log 0·943391
238	$1-v$	. . . .	,, $\bar{2}$·464284
		·25567	,, $\bar{1}$·407675
	$A_{65\cdot37}$	·74433	
P. 150	$a_{64\cdot37}$	8·0791	,, 0·907363
5	p_{64}	. . . .	col. 0·017915
	$\frac{a_{64\cdot37}}{p_{64}}$	8·41934	log 0·925278
150	$a_{65\cdot36}$	7·7999	,, 0·892089
3	p_{36}	. . . .	col. 0·003974
	$\frac{a_{65\cdot36}}{p_{36}}$	7·87160	log 0·896063
	$\frac{a_{64\cdot37}}{p_{64}}$	8·41934	
	$\frac{a_{65\cdot36}}{p_{36}}$	7·87160	
		·54774	
	$A_{65\cdot37}$	·74433	
	Sum,	1·29207	
	Diff.,	·19659	
	$A^{1}_{\overline{65\cdot37}}$	·64603 = half sum.	
	$A_{\overline{65\cdot37}}^{\ \ 1}$	·09830 = ,, diff.	
	$A_{65\cdot37}$	·74433	

The difference between $\dfrac{a_{64\cdot37}}{p_{64}}$ and $\dfrac{a_{65\cdot36}}{p_{36}}$ is here added to and subtracted from $A_{65\cdot37}$: the half sum and the half difference are the complementary survivorship assurances, being together equal to the joint-life assurance.

Here too Orchard's Tables would afford material help. By a single entry in them we should find at once $A_{65\cdot37} = \cdot74433$. Notwithstanding this aid, the operation is sufficiently tedious to render the possession of complete tables of survivorship assurances exceedingly desirable.

The true values of the above benefits, as formed, first, by a continuous process which will be hereafter described, and secondly, by the use of the six-figure logarithms which arise in the annuity operation, are ·646010 and ·098324. Those here formed are consequently affected by errors of $+2$ and -2 in the fifth place, respectively. These errors, which arise in the use of the tabulated four-decimal annuities, may or may not be considered of importance. Generally speaking, if three decimals only are used in the annuities, the errors will be of ten times the magnitude of those that arise when four are used.

Finally, it may be mentioned, that the value of this benefit, deferred n years, will be formed, as in other cases, by multiplying the value for the entire duration of $(x.y)$ by the factor,

$$v^n \cdot {}_np_{x\cdot y}, \text{ or } \frac{D_{x+n}}{D_x} \cdot \frac{l_{y+n}}{l_y}.$$

This is overlooked by Milne, (p. 184,) and Jones, (p. 176,) the expressions given by both of whom involve in their numerical application just three times the amount of work that is really necessary.

2. *Of the Last-Survivor Tables.*

These tables occupy the lower portion of the quadrangular space of which the upper portion is occupied, as already described, by the joint-life annuities. Those of them in which the rate of interest is three per-cent. are on pages 140 to 170; and from these the illustrations now to be given, of the methods employed in the construction of the Last-Survivor Tables, will be taken.

The function under consideration is,

$$a_{\overline{x.y}} = a_x + a_y - a_{x.y} ;$$

and the values of it have to be formed for all the *different* combinations of x and y. It is symmetrical with respect to the variables x and y: its value is not affected by the interchange of these; and therefore it suffices to form it for the cases in which each value of one of the variables, say x, is combined with all the values of the other, y, in succession, that do not exceed it.

It would be an exceedingly onerous task, and withal very unsatisfactory in its results, to form the required values directly, by the addition and subtraction of the single and joint-life annuities. But here the continuous method of construction by differences, which has been already found so effectual and satisfactory, does not fail us; and the tables have been constructed by this method, at the cost of a comparatively small amount of labour, and with all needful assurance of accuracy.

The following is a type of the arrangement adopted in the construction. The main object in view here, as in preceding instances, is to present in columns or in rows the results which in the final arrangement are to occupy similar positions.

x	10	11	12	13	14	15
10	10·10					
11	11·10	11·11				
12	12·10	12·11	12·12			
13	13·10	13·11	13·12	13·13		
14	14·10	14·11	14·12	14·13	14·14	
15	15·10	15·11	15·12	15·13	15·14	15·15
*	*	*	*	*	*	*

Call (x) the older of the two lives in each combination, and (y) the younger. Then we have here the successive values of x at the side, and those of y at the top; and it will be observed that x is constant in the rows, and y in the columns.

Now

$$a_{\overline{x.y}} = a_x + a_y - a_{x \cdot y}.$$

Hence, if x alone vary, as in the columns, we have,

$$\Delta_x a_{\overline{x.y}} = \Delta a_x - \Delta_x a_{x \cdot y};$$

and if y alone vary, as in the rows, we have,

$$\Delta_y a_{\overline{x.y}} = \Delta a_y - \Delta_y a_{x \cdot y}.$$

From the first of these we get, as the formula for the general construction in the columns,

$$a_{\overline{x+1.y}} = a_{\overline{x.y}} + \Delta a_x - \Delta_x a_{x \cdot y}; \quad \ldots \ldots \quad (1.)$$

and from the second, for the construction of verification values in the rows,

$$a_{\overline{x.y+1}} = a_{\overline{x\,y}} + \Delta a_y - \Delta_y a_{x \cdot y}; \quad \ldots \ldots \quad (2.)$$

Also, if x and y both vary, we have,

$$\Delta_{x \cdot y} a_{\overline{x\,y}} = \Delta a_x + \Delta a_y - \Delta_{x \cdot y} a_{x \cdot y};$$

and this gives as the formula for the construction of series of terms descending diagonally,

$$a_{\overline{x+1.y+1}} = a_{\overline{.y}} + \Delta a_x + \Delta a_y - \Delta_{x \cdot y} a_{x \cdot y} \quad \ldots \quad (3.)$$

Formula (3) comes into use only in the formation of the series of initial terms.

In seeking to apply these formulæ we are met by a difficulty at the outset: while the differences are all essentially negative, those that occur in each formula are affected with unlike signs. This would seem to imply that in each case, to pass from one value to the next, both an addition and a subtraction would be necessary. But the difficulty, such as it is, is easily surmounted. We use the differences which, in their normal form, would give rise to arithmetical subtraction, in their complementary form; and thus the operation becomes one of uniform addition.

The *arithmetical equivalent** of a negative number is formed in the same way as the mixed form of a negative logarithm. Thus the arithmetical equivalent of -2576 is $\bar{1}7424$. In the first form the whole of the number is negative, while in the second the last four figures are positive, and the prefix 1 only is negative. The two forms being equal in value they may be used indiscriminately in arithmetical operations. Thus, the algebraical sum of 4865923 and -2576 will be determined by either of the following operations :—

$$\begin{array}{r} 4865923 \\ -2576 \\ \hline 4863347 \end{array} \qquad \begin{array}{r} 4865923 \\ \bar{1}7424 \\ \hline 4863347 \end{array}$$

But the arithmetical equivalent is not restricted to the above form. We may write it $\bar{1}7424$, $\bar{1}97424$, $\bar{1}997424$, and so on. We have thus the power of bringing up the positive portion of an arithmetical equivalent to any number of places we please, which enables us often to dispense with the necessity of writing the negative prefix at all, or of otherwise particularly attending to it. Thus, to form the aforesaid sum :—

$$\begin{array}{r} 4865923 \\ \underline{9997424} \\ 4863347 \end{array}$$

We simply neglect the last carriage, which in such cases is always a unit.

It must not be supposed that when, as in the case before us, it is necessary to use a series of differences in their mixed form, we require first to construct them in their normal form, and thence to pass to the other. They are just as easily constructed in the one form as in the other; and therefore they are to be constructed in that form only in which they are required for use.

* This is the term applied by the late Peter Nicholson to these complementary numbers. He appends a brief tract on Arithmetical Equivalents to the second edition of his *Essay on Involution and Evolution*, published in 1820.

Inspection of the foregoing formulæ will shew that it is the differences of the single-life annuities that have to be used in their mixed form in order that the operation shall be one of addition throughout. The following shews the mode of constructing the differences of the series a_x, (p. 14), in both forms :—

	a_x	Δ	Δ
10	24·1484	−1531	8469
11	23·9953	−1811	8189
12	23·8142	−2039	7961
13	23·6103	−2206	7794
14	23·3897	−2316	7684
15	23·1581		
*	*	*	*

Since $\Delta a_x = a_{x+1} - a_x$, and here a_{x+1} is less than a_x, the first of the two columns marked Δ, which contains the differences in their normal form, is constructed by subtracting, arithmetically, the several lines from those above them; and the results are consequently negative. The differences in their mixed form, on the other hand, are constructed by subtracting, arithmetically, each line from that below it. These occupy here the second of the two columns marked Δ. The negative prefixes, however, being omitted, as not required for our purpose, the portions exhibited are essentially positive.

This column was completed for the purpose of the present construction; and it will be well now to shew how the differences of the other series, $a_{x \cdot y}$, were formed. Inspection of the formulæ shews that these, to admit of their combination with the others by arithmetical addition, require to be exhibited in their normal negative form.

The differences of $a_{x \cdot y}$ involved in the formulæ are, as indicated by their symbols, deduced from different successions of the terms of that function. Thus, the difference involved in formula (1), symbolized by $\Delta_x a_{x \cdot y}$, implying that in the primary function x takes the increment unity in passing from term to term, while y remains constant, is formed from the rows in the table, pp. 140 to 170. That in formula (2), which is symbolized by

$\Delta_y a_{x \cdot y}$, is formed from the columns, in which, as we know, y varies, while x remains constant. And that in formula (3), symbolized by $\Delta_{x \cdot y} a_{x \cdot y}$, is formed from series of terms descending diagonally, in which order both x and y increase by a unit.

1. To form $\Delta_x a_{x \cdot y}$. It would no doubt have been quite possible to form all the series of differences wanted from the copy of the table written out for the printer. To have done so, however, in the case of the present series, would obviously have been a most irksome task. Every row has to be differenced, the subtractions have to be performed sideways, and there is no space whereon to set down the results. The formation was therefore superposed upon the original computations. There the rows, although in reverse order, are the same as in the printed table; and there is ample space for setting down the differences as formed, so as to permit revision in case of a discrepancy shewing itself.

The method employed will be clearly understood from the following specimen. It consists of the terminal portion of the six (double) columns of the formation of $a_{x \cdot y}$, the initial portion of which is given on pp. l, li.

The subtractions being made sideways, the differences are seen here ranged each under its minuend.

2. To form $\Delta_y a_{x \cdot y}$. This difference, as stated, is formed from the columns. It comes into use for the formation of series for verification; and as only four or five of these are required, perhaps the best method of proceeding is to copy out the proper columns and difference them in the usual way.

A specimen of the main formation will be given presently. The formation of the series requisite for its verification is here shewn.

Formation of $a_{x\cdot y}$, and $\Delta a_{x\cdot y}$.

y	$x-y=0$		$x-y=1$		$x-y=2$	
15	298112	19·8661	294938	19·7214	291732	19·5764
	984760	1447	984713	1450	984550	1466
	319429	2804	316383		313338	
	11		36		30	
14	304200	20·1465	301132	20·0047	297918	19·8572
	984627	1418	984693	1475	984646	1482
	325239	2646	322286		319239	
	0		30		17	
13	309866	20·4111	307009	20·2773	303902	20·1327
	984275	1338	984451	1446	984517	1505
	330576	2386	327907		324953	
	63		9		2	
12	314914	20·6497	312367	20·5290	309472	20·3926
	983691	1207	983983	1364	984159	1475
	335439	2021	332959		330194	
	13		64		69	
11	319143	20·8518	317006	20·7494	314422	20·6264
	982896	1024	983294	1230	983586	1391
	339446	1561	337442		334962	
	41		6		21	
10	322383	21·0079	320742	20·9287	318569	20·8243
		792		1044		1256

Verifications of $a_{\overline{x.y}}$.

	51	Δ
10	20·4046	− 675
11	·3371	− 920
12	·2451	− 1124
13	·1327	− 1280
14	·0047	− 1386
15	19·8661	

a_{15}	23·1581	*p.* 14
,, 10	24·1484	,, ,,
	47·3065	
$a_{15\cdot 10}$	20·4046	,, 141
15·10	26·9019	
	8469	
	675	
15·11	·8163	
	8189	
	920	
15·12	·7272	
	7961	
	1124	
15·13	·6357	
	7794	
	1280	
15·14	·5431	
	7684	
	1386	
15·15	·4501	

Formation of $a_{x\cdot y}$ *and* $\Delta a_{x\cdot y}$ (continued).

y	$x-y=3$		$x-y=4$		$x-y=5$	
15	288603	19·4358	285680	19·3055	282998	19·1866
	984272	1303	983876	1189	983459	1148
	310389		307537		304970	
	3		76		93	
14	294664	19·7090	291489	19·5654	288522	19·4322
	984483	1436	984205	1332	983809	1218
	316098		313053		310294	
	61		85		21	
13	300642	19·9822	297343	19·8309	294124	19·6845
	984470	1513	984307	1464	984029	1361
	321810		318668		315622	
	40		41		23	
12	306320	20·2451	303016	20·0917	299674	19·9377
	984225	1534	984178	1540	984015	1493
	327240		324096		320858	
	19		15		70	
11	311484	20·4873	308289	20·3371	304943	20·1810
	983762	1502	983828	1561	983781	1567
	332101		329051		325906	
	80		85		41	
10	315943	20·6987	312964	20·5572	309728	20·4046
		1415		1526		1586

The column headed 15, p. 141, is copied out, (the value of $a_{15\cdot15}$ being taken from p. 140,) and differenced. On the right $a_{\overline{15\cdot10}}$ is formed as shewn, and the successive terms $a_{\overline{15\cdot11}}$, &c., are formed by the continuous addition of two series of differences, of which the first is Δa_y, formed on p. lxii, and the second is $\Delta_y a_{x\cdot y}$, formed in the column adjoining on the left.

3. To form $\Delta_{x\cdot y}\, a_{x\cdot y}$. This difference comes into use only in the construction of the initial terms of the several columns in the main formation; and in these $x=y$. The formula consequently for this case becomes,

$$a_{\overline{x+1\cdot x+1}} = a_{x\cdot x} + 2\Delta a_x - \Delta_{x\cdot x} a_{x\cdot x}\,;$$

and the series to be differenced will be that on p. 140, headed $a_{x\cdot x}$. The formation of $\Delta_{x\cdot x}\, a_{x\cdot x}$, was, like that of $\Delta_x\, a_{x\cdot y}$, superposed upon the joint-life computations; and on reference to the specimen on p. lxiv, the values of the former of these will be found in the first column, (in which $x = y$,) under those of the latter which fall in the same column, but necessarily in reverse order.

The following is an example of the formation of the initial terms of the several columns :—

Initial Terms.

a_{10}	24·1484	p. 14
,,$_{10}$	24·1484	,, ,,
	48·2968	
,,$_{10·10}$	21·0079	,,140
10·10	27·2889	
	6938	
	1561	
11·11	·1388	
	6378	
	2021	
12·12	26·9787	
	5922	
	2386	
13·13	·8095	
	5588	
	2646	
14·14	·6329	
	5368	
	2804	
15·15	·4501	
*	*	

Verification.

a_{15}	23·1581
,, ,,	23·1581
	46·3162
,,$_{15·15}$	19·8661
15·15	26·4501

Of the two series of differences here employed the first is $2\Delta a_x$, the double of the series formed on p. lxii, and the second is $\Delta_{x·x} a_{x·x}$, whose formation has just been described.

The principal formation, like others that have preceded, occupies a triangular space, having 87 columns and 87 rows. The initial portion of the first six columns is here given.

Formation of $a_{\overline{xy}}=a_x+a_y-a_{x\cdot y}$.

	10	11	12	13	14	15
10	27·2889 8469 792					
11	·2150 8189 1044	27·1388 8189 1024				
12	·1383 7961 1256	·0601 7961 1230	26·9787 7961 1207			
13	·0600 7794 1415	26·9792 7794 1391	.8955 7794 1364	26·8095 7794 1338		
14	26·9809 7684 1526	·8977 7684 1502	·8113 7684 1475	·7227 7684 1446	26·6329 7684 1418	
15	·9019	·8163	·7272	·6357	·5431	26·4501
*	*	*	*	*	*	*

The values of x are at the side and those of y at the top. The initial terms were first inserted, and next the verification series. The series Δa_x, (8469, 8189, &c.) was then entered in column 10; and the successive terms of it were carried out horizontally, as shewn. The series $\Delta_x a_{x\cdot y}$ were then inserted, that which in the specimen (pp. lxiv, lxv,) occupies the last *row*, in the first *column;* that which occupies the next to the last *row*, in the second *column;* and so on. The numbers opposite the several *rows*, in fact, indicate the *columns* in which the differences in those rows are to be entered, respectively. The final additions were then proceeded with, without interruption.

The method employed in the construction of this table is in description somewhat tedious; but it will not be considered so in application, by any one accustomed to the construction and verification of tables, when it is mentioned, that the time occupied in the construction of a complete table did not exceed

$46\frac{1}{2}$ hours. Of this time $2\frac{1}{2}$ hours were required for the formation and insertion in their places of the initial and the verification series, and the remaining 44 sufficed for the formation and transference of the differences, and the final additions.

It may not be out of place to point out that while, as in the case of a joint-life annuity and its corresponding assurance, we may pass from a last-survivor annuity to a last-survivor assurance either by the usual formula

$$A_{\overline{xy}} = 1 - (1 - v)(1 + a_{\overline{xy}}),$$

or by the use of Orchard's Table, a like analogy does not hold in regard to the mode of passing from a whole life to a deferred last-survivor annuity. The component annuities here, $a_x + a_y - a_{x\cdot y}$, must be dealt with separately.

3. *Of the Construction of Survivorship Assurance Tables.*

The present volume contains no Survivorship Assurance Tables. A complete set of such tables would form a most desirable addition to those that are here given. The Council have no immediate intention of undertaking their construction, what they have done, in connexion with the $\mathrm{H^M}$ table at least, being sufficient to admit of the exact treatment of all cases in which not more than two lives are involved. The field is therefore open for such members of the Institute, or others, who, recognising the additional facility in the treatment of the more complex cases that would be conferred by the possession of a set of Survivorship Assurance Tables, have the time and the inclination to undertake their construction. While by so doing the benefit they would confer on their profession would be great, that which they would derive personally from the exercise would be by no means small.

To facilitate this construction, by whomsoever it may be undertaken, the tables on pp. 236 and 237 have been formed. We proceed to explain the methods employed in the formation of these, and shall then shew the manner in which they are to be used in the construction of Survivorship Assurance Tables.

The functions tabulated are $\log(p_x^{-1}-1)$ and $\log\frac{1}{2}(p_x^{-1}+1)$. We have,

$$\log(p_x^{-1}-1)=\log\frac{l_x-l_{x+1}}{l_{x+1}}=\log\frac{d_x}{l_{x+1}}=\log d_x+\operatorname{colog} l_{x+1}.$$

$$\therefore \Delta\log(p_x^{-1}-1)=\Delta\log d_x+\operatorname{colog} p_{x+1};$$

and hence, $\log(p_{x+1}^{-1}-1)=\log(p_x^{-1}-1)+\Delta\log d_x+\operatorname{colog} p_{x+1}$. Again,

$$\log\tfrac{1}{2}(p_x^{-1}+1)=\log\tfrac{1}{2}\frac{l_x+l_{x+1}}{l_{x+1}}=\log\tfrac{1}{2}+\log(l_x+l_{x+1})+\operatorname{colog} l_{x+1}.$$

Hence,

$$\Delta\log\tfrac{1}{2}(p_x^{-1}+1)=\Delta\log(l_x+l_{x+1})+\operatorname{colog} p_{x+1};$$

$$\therefore \log\tfrac{1}{2}(p_{x+1}^{-1}+1)=\log\tfrac{1}{2}(p_x^{-1}+1)+\Delta\log(l_x+l_{x+1})+\operatorname{colog} p_{x+1}.$$

By these formulæ the series were constructed, a preliminary in the case of the second of them being the formation of $\log(l_x+l_{x+1})$ with its differences, a very simple matter. The following is an example :—

Formation of $\log(p_x^{-1}-1)$.

Log d_{10}	2·690196
Col. l_{11}	$\bar{5}$·002133
10	$\bar{3}$·692329
	908595
	1736
11	·602660
	918405
	1444
12	·522509
	942196
	1268
13	·465973
*	*

Formation of $\log\frac{1}{2}(p_x^{-1}+1)$.

Log ·5	$\bar{1}$·698970
„ $(l_{10}+l_{11})$	5·299965
Col. l_{11}	$\bar{5}$·002133
10	0·001068
	998065
	1736
11	·000869
	998409
	1444
12	·000722
	998644
	1268
13	·000634
*	*

A survivorship assurance on (x) against (y) is an assurance payable at the end of the year in which the combination (xy) is dissolved, provided the dissolution is caused by the death of (x). When the sum assured is a unit the value of the assurance is denoted by $A^1_{\overline{xy}}$.

The value of this assurance may be conceived to be composed of two portions, one having reference to the first year, and the other to all the years after the first. Now it is shewn, (Gray's *Tables and Formulæ*, page 73,) that the probability of (x) dying before (y) in the first year is

$$\tfrac{1}{2}(1-p_x)(1+p_y)\ ;$$

hence the value of the first portion of the assurance is,

$$\tfrac{1}{2}v(1-p_x)(1+p_y)\ ;$$

and the value of the second portion is obviously,

$$vp_{x\cdot y}A_{\overset{1}{\overline{x+1\cdot y+1}}},$$

in which $A_{\overset{1}{\overline{x+1\cdot y+1}}}$ denotes the value of a similar assurance on $(x+1)$ against $(y+1)$.

Hence,

$$\begin{aligned}A_{\overset{1}{\overline{x\cdot y}}} &= v[\tfrac{1}{2}(1-p_x)(1+p_y)-p_{x\cdot y}A_{\overset{1}{\overline{x+1\cdot y+1}}}]\\ &= vp_{x\cdot y}[\tfrac{1}{2}(p_x^{-1}-1)(p_y^{-1}+1)+A_{\overset{1}{\overline{x+1\cdot y+1}}}\ ;\end{aligned}$$

or, in logarithms,

$$\log A_{\overset{1}{\overline{x\cdot y}}} = \log vp_{x\cdot y} + \log[\tfrac{1}{2}(p_x^{-1}-1)(p_y^{-1}+1)+A_{\overset{1}{\overline{x+1\cdot y+1}}}].$$

This is the working formula, by means of which, commencing with a combination in which x and y, having between them a specified difference, one or other, (or both,) is the greatest tabular age, we may form in succession, the values corresponding to all the combinations in which the variables have the same difference. For this purpose, and for the formation of a complete table, we require, first, $\log vp_{x\cdot y}$ for all the *different* combinations of x and y. These logarithms have been already formed for use in the construction of $a_{x\cdot y}$, and would of course be immediately available. And we want, secondly, to be used as will be presently shewn, $\log \tfrac{1}{2}(p_x^{-1}-1)(p_y^{-1}+1)$, not for the *different* combinations merely, but for *all* the combinations of the two variables x and y. The cause of this duplication of the number of logarithms to be formed—for it amounts to a duplication—is that this function is not, like the other, symmetrical with respect to x and y.

The simplest arrangement for the formation of log $\tfrac{1}{2}(p_x^{-1}-1)(p_y^{-1}+1)$ would be in a quadrangular space, consisting of 87 columns and the same number of rows, having the successive values of, say, x, at the top, and those of y at the side. But this arrangement is objectionable inasmuch as the series in which $x-y$ and $y-x$ are constant, (which are the series more particularly required,) would find their places in it in diagonal lines; and thus a difficulty would be interposed to the taking of them out in order. The formation will therefore be effected in two compartments, of both of which the following is a type:—

	96	95	94	93	92	91
86	96·10					
85	96·11	95·10				
84	96·12	95·11	94·10			
83	96·13	95·12	94·11	93·10		
82	96·14	95·13	94·12	93·11	92·10	
81	96·15	95·14	94·13	93·12	92·11	91·10
*	*	*	*	*	*	*

In the first compartment $x>y$; and, the successive values of x being at the top, those of $x-y$ are at the side. In the second compartment $x<y$; hence, the values of y being at the top, those of $y-x$ are at the side.

1. $x>y$. In descending diagonally x varies in reverse order. Hence the initial terms will be formed by the continuous addition of the negative differences of $\log(p_x^{-1}-1)$, in reverse order.

In the rows both x and y vary, in reverse order. Hence verification series will be formed by the continuous addition of the two series of negative differences in the table, in reverse order.

In the columns y varies, in direct order. Hence the principal formation will consist in the continuous addition of the terms of the series $\Delta \log \frac{1}{2}(p_y^{-1}+1)$.

2. $x<y$. Between this case and the last there is simply an interchange of the functions in x and y. The modification this causes in the working formulæ is easily seen; and it will receive illustration in the examples now to be given.

It is necessary first to form the initial and verification series. The following are specimens of these formations:—

$x>y$

Initial Terms.

Log $(p_{\overline{96}}^{1}-1)$	0·647817
„ $\frac{1}{2}(p_{\overline{10}}^{1}+1)$	0·001068
96·10	0·648885
	596485
95·10	·245370
	768379
94·10	·013749
	839603
93·10	·853352
	881377
92·10	·734729
	924397
91·10	·659126
*	*

Verification Series.

$x-y=81$

Log $(p_{\overline{96}}^{1}-1)$	0·647817
„ $\frac{1}{2}(p_{\overline{15}}^{1}+1)$	0·000625
96·15	0·648442
	596485
	999976
95·14	·244903
	768379
	33
94·13	·013315
	839603
	88
93·12	·853006
	881377
	147
92·11	·734530
	924397
	199
91·10	·659126

$x-y=0$

Log $(p_{\overline{96}}^{1}-1)$	0·647817
„ $\frac{1}{2}(p_{\overline{96}}^{1}+1)$	0·508155
96·96	1·155972
	596485
	765437
95·95	·517894
	768379
	906767
94·94	·193040
	839603
	951849
93·93	·984492
	881377
	971865
92·92	·837734
	924397
	984957
91·91	·747088
*	*

$x<y$

Initial Terms.

Log $\frac{1}{2}(p_{\overline{95}}^{1}+1)$	0·508155
„ $(p_{\overline{10}}^{1}-1)$	$\bar{3}$·692329
96·10	$\bar{2}$·200484
	765437
95·10	·965921
	906767
94·10	·872688
	951849
93·10	·824537
	971865
92·10	·796402
	984957
91·10	·781359
*	*

Verification Series.

$y-x=81$

Log $\frac{1}{2}(p_{\overline{96}}^{1}+1)$	0·508155
„ $(p_{\overline{15}}^{1}-1)$	$\bar{3}$·459280
96·15	$\bar{3}$·967435
	765437
	983071
95·14	·715943
	906767
	023622
94·13	·646332
	951849
	056536
93·12	·654717
	971865
	080151
92·11	·706733
	984957
	089669
91·10	·781359

$y-x=0$

Log $\frac{1}{2}(p_{\overline{96}}^{1}+1)$	0·508155
„ $(p_{\overline{96}}^{1}-1)$	0·647817
96·96	1·155972
	765437
	596485
95·95	·517894
	906767
	768379
94·94	·193040
	951849
	839603
93·93	·984492
	971865
	881377
92·92	·837734
	984957
	924397
91·91	·747088
*	*

The following are specimens of the formation of the principal series :—

Formation of $Log\,\frac{1}{2}\,(p_x^{-1}-1)(p_y^{-1}+1)$.

$x > y$.

	96	95	94	93	92	91
86	648885 999801					
85	648686 999853	245370 999801				
84	648539 999912	245171 999853	013749 999801			
83	648451 999967	245024 999912	013550 999853	853352 999801		
82	648418 24	244936 999967	013403 999912	853153 999853	734729 999801	
81	648442	244903	013315	853006	734530	659126
*	*	*	*	*	*	*
5	736847 15043	321276 12056	080689 8966	915726 4566	794506 2597	715246 3657
4	751890 28135	333332 15043	089655 12056	920292 8966	797103 4566	718903 2597
3	780025 48151	348375 28135	101711 15043	929258 12056	801669 8966	721500 4566
2	828176 93233	376510 48151	116754 28135	941314 15043	810635 12056	726066 8966
1	921409 234563	424661 93233	144889 48151	956357 28135	822691 15043	735032 12056
0	155972	517894	193040	984492	837734	747088

$x < y$

	96	95	94	93	92	91
86	200484 910331					
85	110815 919849	965921 910331				
84	030664 943464	876252 919849	872688 910331			
83	974128 976378	796101 943464	783019 919849	824537 910331		
82	950506 16929	739565 976378	702868 943464	734868 919849	796402 910331	
81	967435	715943	646332	654717	706733	781359
*	*	*	*	*	*	*

	96	95	94	93	92	91
5	166213 75603	862236 69414	710611 58392	629936 32524	582319 19482	538484 28792
4	241816 118623	931650 75603	769003 69414	662460 58392	601801 32524	567276 19482
3	360439 160397	007253 118623	838417 75603	720852 69414	634325 58392	586758 32524
2	520836 231621	125876 160397	914020 118623	790266 75603	692717 69414	619282 58392
1	752457 403515	286273 231621	032643 160397	865869 118623	762131 75603	677674 69414
0	155972	517894	193040	984492	837734	747088

It may be mentioned in regard to the preceding formations, that when the initial and verification series have been inserted in their places, the whole of the subsequent work need not, and will not, occupy a fairly expert arithmetician more than twenty-four hours.

Also, since the element of interest is not involved in these series, when they have been once formed, they can be used in connexion with any rate of interest that may be proposed.

Having now got the auxiliary series, we are prepared for the construction of the required tables of $A^1_{x\cdot y}$.

The formula is,

$$\log A^1_{\overline{xy}} = \log v p_{x\cdot y} + \log\left[\tfrac{1}{2}\,(p_x^{-1}-1)(p_y^{-1}+1) + A^1_{\overline{x+1\,y+1}}\right],$$

which, for the moment, we will write,

$$\log a = \log b + \log\,(c+d).$$

Here $\log b$, $\log c$ and $\log d$* are known ; and to obtain $\log a$ it is requisite first to form $\log (c+d)$.

This of course can be done by the use of the common tables, but the operation would be a tedious and laborious one. Fortunately this labour need not be incurred ; the end in view can be attained with great facility by the aid of the

* It will be presently shewn that when either x or y is the oldest tabular age, $\log A^1_{\overline{x+1\cdot y+1}}$, that is $\log d$, is known ; and from this value we descend to those corresponding to the younger ages, in succession.

table employed in the formation of $a_{x\cdot y}$. The table in question, as already mentioned,* gives $\log(1+x)$ corresponding to successive values of $\log x$; its characteristic equation being,

$$\mathrm{T}[\log x] = \log(1+x),$$

in which T is a functional symbol denoting the tabular result corresponding to the appended argument.

In this equation write $\frac{d}{c}$ for x, and we get,

$$\mathrm{T}[\log \tfrac{d}{c}] \text{ or } \mathrm{T}[\log d - \log c]$$

$$= \log(1+\tfrac{d}{c}) = \log(\tfrac{c+d}{c}) = \log(c+d) - \log c.$$

$$\therefore \log(c+d) = \log c + \mathrm{T}[\log d - \log c].$$

It thus appears that $\log(c+d)$ is formed by adding to $\log c$ the tabular result corresponding to $\log d - \log c$.

We have, therefore,

$$\log a = \log b + \log c + \mathrm{T}[\log d - \log c];$$

and, changing the order of the first two terms, the work is very commodiously arranged as follows :—

	$\log d$	
	$\log c$ $\log b$ $\mathrm{T}[\log d - \log c]$	$\log d - \log c$
Sum	$\log a$	

Log d is supposed to have been just formed; and, $\log c$ and $\log b$ having been previously inserted in their places, $\log c$ is subtracted from $\log d$, and the tabular result answering to the difference is written under $\log b$. Addition of the three lines then gives $\log a$, which forms the $\log d$, of the next operation.

The type just given is here repeated, with the values of a, b, c and d restored; and the arithmetical operation by which we pass from $\log \mathrm{A}_{\frac{1}{x+1\cdot y+1}}$ to $\log \mathrm{A}_{\frac{1}{x\cdot y}}$ is clearly exhibited. The numbers corresponding to the logarithms successively formed are not to be taken out till the close of the operation.

* P. lii.

D_1	$\log A^{1}_{\overline{x+1\cdot y+1}}$	$A^{1}_{\overline{x+1\cdot y+1}}$
A	$\log \frac{1}{2}(p_x^{-1}-1)(p_y^{-1}+1)$	$D_1 - A$
B	,, $v p_{x\cdot y}$	
C	$T[D_1 - A]$	
D $\left\{\right.$	$A+B+C$ $=\log A^{1}_{\overline{xy}}$	$A^{1}_{\overline{xy}}$

The arrangement adopted in the formation of $A^{1}_{\overline{xy}}$ is similar to that employed in the construction of $a_{x\cdot y}$. It is typified as follows :—

	0	1	2	3	4	5	6
97	97·97						
96	96·96	97·96					
95	95·95	96·95	97·95				
94	94·94	95·94	96·94	97·94			
93	93·93	94·93	95·93	96·93	97·93		
92	92·92	93·92	94·92	95·92	96·92	97·92	
91	91·91	92·91	93·91	94·91	95·91	96·91	97·91
*	*	*	*	*	*	*	*

Here for $x>y$, $x-y$, (constant in the columns,) is at the top, and y, (constant in the rows,) is at the side; and for $x<y$, $y-x$ is at the top, and x at the side. This arrangement affords the greatest facility for the transfer of the values formed to the tables arranged for use ; since in these the values that are here found in the rows, will take their places in either columns or rows.

The first thing now to be done is to form the initial values for the several columns.

The expression in its first form is,

$$A^{1}_{\overline{xy}} = v\left[\tfrac{1}{2}(1-p_x)(1+p_y) + p_{x\cdot y}\, A^{1}_{\overline{x+1\cdot y+1}}\right].$$

Case 1. $x=y$. Let x and y each equal 97. Then p_x, p_y, and $p_{x\cdot y}$ vanish, and the expression reduces to,

$$A^{1}_{\overline{97\cdot 97}} = \tfrac{1}{2}v\ ;$$

whence,

$$\log A^{1}_{\overline{97\cdot 97}} = \log \cdot 5 + \log v.$$

Case 2. $x>y$. Let $x=97$; then p_x and $p_{x\cdot y}$ vanish, and we have,

$$A^1_{\overline{97\cdot y}}=\tfrac{1}{2}v(1+p_y)=vp_y\cdot\tfrac{1}{2}(p_y^{-1}+1);$$

whence,

$$\log A^1_{\overline{97\cdot y}}=\log vp_y+\log\tfrac{1}{2}(p_y^{-1}+1).$$

Case 3. $x<y$. If y here equal 97, p_y and $p_{x\cdot y}$ vanish, and we get,

$$A^1_{\overline{x\cdot 97}}=\tfrac{1}{2}v(1-p_x)=\tfrac{1}{2}vp_x(p_x^{-1}-1);$$

from which,

$$\log A^1_{\overline{x\cdot 97}}=\log\cdot5+\log vp_x+\log(p_x^{-1}-1).$$

For Case 1 we have,

log ·5	$\bar{1}$·698970
„ v	$\bar{1}$·987163
	$\bar{1}$·686133

For Cases 2 and 3 the initial terms may be formed in series, as follows:—

Initial Terms.

$x>y$

Log vp_{96}	$\bar{1}$·251209
„ $\frac{1}{2}(p_{96}^{-1}+1)$	0·508155
97·96	$\bar{1}$·759364
	295816
	765437
97·95	·820617
	132721
	906767
97·94	·860105
	73995
	951849
97·93	·885949
	45456
	971865
97·92	·903270
	25089
	984957
97·91	·913316
*	*

$x<y$

Log ·5	$\bar{1}$·698970
„ vp_{96}	$\bar{1}$·251209
„ $(p_{96}^{-1}-1)$	0·647817
96·97	$\bar{1}$·597996
	295816
	596485
95·97	·490297
	132721
	768379
94·97	·391397
	73995
	839603
93·97	·304995
	45456
	881377
92·97	·231828
	25089
	924397
91·97	·181314
*	*

These series being, almost necessarily, formed in reverse order, it is the complementary differences of their component functions which constitute the addends. Thus for $x>y$ the addends are, Δ colog vp_y and Δ colog $\frac{1}{2}(p_y^{-1}+1)$; and for $x<y$ they are, Δ colog vp_x and Δ colog $(p_x^{-1}-1)$. For Δ colog vp_x and Δ colog vp_y, (the series being identical,) we use Δ colog p_x, as on p. xliv, subjected to the corrections there specified; and the differences of colog $\frac{1}{2}(p_y^{-1}+1)$ and colog $(p_x^{-1}-1)$ are the negative differences of log $\frac{1}{2}(p_y^{-1}+1)$ and log $(p_x^{-1}-1)$. They are of course used in reverse order.

The specimens of the main formation will be found on pp. lxxx, lxxxi, lxxxii and lxxxiii.

The initial terms are first inserted in their places; and then, in accordance with the type on p. lxxvi, the terms of the two auxiliary series, which are taken, the first from the formation on p. lxxiii, and the second from that on p. lxxiv.

The working then commences, and is carried on in each column, till all the columns in succession, in both compartments, are brought down to the same point, say $y=85$, and $x=85$, when measures will be taken for verification, as will be presently explained. Referring to the column $x-y=0$, $(x>y)$, 155972 is subtracted from the initial term, which is log $A^1_{\overline{97\cdot97}}$, and the difference 530161 is set down opposite the subtrahend. It is easily ascertained that the index of this logarithm is $\bar{2}$. Entering the table then with $\bar{2}$·530161, the result, 014477, is set down as shewn; and summation of the three lines gives for log $A^1_{\overline{96\cdot96}}$, ·685705. This forms the initial term for another similar operation, the result of which is ·684407 = log $A^1_{\overline{95\cdot95}}$. And so by a succession of such operations the column is completed, and all the values of log $A^1_{x.y}$ in which $x=y$ are formed. The operations in the other columns also, are entirely analogous to that described, the values formed in each being those in which the differences between x and y are as at the top, respectively.

The same remarks apply to the second compartment, in which $x<y$. The first column here would be identical with the corresponding column in the first compartment, and therefore it is unnecessary to insert the figures.

It is, as has been said, the remainders of the subtractions that occur in the several operations, that form the tabular arguments. These regularly increase in magnitude, and it is therefore sufficient formally to determine the index of the first of them, since, in succeeding remainders an increase (of a unit) in the index is always pointed out by a decrease in the mantissa. Examples are seen in the first three columns of both compartments, where, after the first step, the index increases from $\bar{2}$ to $\bar{1}$, the increase in each case being accompanied by a decrease in the mantissa.

For the verification of the foregoing construction, it is recommended that the work be performed in duplicate by independent computers. It ought to be carried on in sections, each embracing twelve or fifteen of the ages at the side, and ending in both sets of computations with the same row. Comparison of this row in the two sets will show if error has been committed; and if so it must be sought out and removed. Each section must be finished and corrected ere commencing the next.

But if, as will usually be the case, the annuities on the joint-lives have been previously formed, verification can be otherwise obtained. For we can, by Orchard's Table, pass from the annuities to the corresponding assurances; and we can also, by addition of the proper values in the table being formed, find the values of the same assurances. This follows from the equation,

$$A_{x\cdot y}=A_{\frac{1\;\;}{x\cdot y}}+A_{\frac{\;\;1}{x\cdot y}};$$

that is, the sum of the two survivorship assurances in which the ages are interchanged, is equal to the assurance on the joint-lives. And the values in which the ages are thus interchanged are very readily found, as they occupy corres-

Formation of $N'_{x,y}$

$x > y$

y	$x-y=0$		$x-y=1$		$x-y=2$	
97	686133	·485437			—	—
	155972	2·530161				
	515256					
	014472					
	5					
96	685705	·484959	759364	·574598	—	—
	517894	1·167811	921409	2·837955		
	106887		811071			
	059625		028859			
	1		61			
95	684407	·483512	761400	·577298	820617	·661633
	193040	·491367	424661	1·336739	828176	2·992441
	372329		239608		943792	
	117257		085333		040671	
	15		7		40	
94	682641	·481550	749609	·561835	812679	·649650
	984492	·698149	144889	·604720	376510	1·436169
	520319		446324		313603	
	175801		146884		104815	
	17		6		14	
93	680629	·479323	738103	·547146	794942	·623651
	837734	·842895	956357	·781746	116754	·678188
	611232		565776		491781	
	229504		205454		169245	
	39		17		29	
92	678509	·476990	727604	·534078	777809	·599527
	747088	·931421	822691	·901913	941314	·836495
	661408		636319		590863	
	268083		256078		226888	
	10		6		39	
91	676589	·474886	715094	·518912	759104	·574254
	665618	·010971	735032	·980062	810635	·948469
	702488		681949		656860	
	306514		291145		275996	
	36		30		32	
90	674656	·472777	708156	·510689	743523	·554017
	598260	·076396	656652	·051504	726066	·017457
	733575		718031		697492	
	340853		327543		309817	
	53		2		29	
89	672741	·470667	702228	·503767	733404	·541257
*	*	*	*	*	*	*

Formation of $A_{\overline{x.y}|}^{1}$ (continued).

$x > y$

	$y-x=3$		$y-x=4$		$y-x=5$	
94	860105 780025 017787 049306 9	·724612 1·080080				
93	847127 348375 359060 119019 12	·703278 ·498752	885949 751890 063244 055434 7	·769040 1·134059		
92	826466 101711 516868 184838 19	·670603 ·724755	870575 333332 384147 128564 11	·742292 ·537243	903270 736847 088331 059446 3	·800332 1·166423
91	803436 929258 611404 242626 34	·635669 ·874178	846054 089665 537409 196054 32	·701543 ·756389	884627 321276 404688 135402 14	·766703 ·563351
90	783322 801669 672403 291927 26	·607186 ·981653	823160 920292 626947 255144 30	·665516 ·902868	861380 080689 552952 205040 35	·726742 ·780691
89	766025	·583479	802413	·634473	838716	·689788
*	*	*	*	*	*	*

$x<y$

x	$y-x=0$		$y-x=1$		$y-x=2$	
97	686133	·485437				
96		·484959	597996	·396274		
			752457 811071 029377 35	$\bar{2}$·845539		
95		·483512	592940	·391688	490297	·309241
			286273 239608 080115 11	$\bar{1}$·306667	520836 943792 038664 41	$\bar{2}$·969461
94		·481550	606007	·403562	503333	·318664
			032643 446324 138103 18	·573364	125876 313603 092879 11	$\bar{1}$·377457
93		·479323	617088	·414084	532369	·340698
			865869 565776 194208 7	·751219	914020 491781 150830 15	·618349
92		·476990	625860	·422532	556646	·360285
			762131 636319 238205 12	·863729	790266 590863 199714 29	·766380
91		·474886	636667	·433179	580872	·380954
			677674 681949 280966 45	·958993	692717 656860 248674 24	·888155
90		·472777	640634	·437154	598275	·396529
			607226 718031 318051 4	·033408	619282 697492 290608 46	·978993
89		·470697	643312	·439858	607428	·404975
*	*	*	*	*	*	*

$x<y$

x	$y-x=3$		$y-x=4$		$y-x=5$	
94	391397	·246262				
	360439	1·030958				
	017787					
	044294					
	6					
93	422526	·264561	304995	·201834		
	007253	·415273	241816	$\bar{1}$·063179		
	359060		063244			
	100417		047523			
	15		9			
92	466745	·292917	352592	·225212	231828	·170541
	838417	·628328	931650	·420942	166213	$\bar{1}$·065615
	516868		384147		088331	
	153788		101600		047783	
	8		9		2	
91	509081	·322910	417406	·261460	302329	·200599
	720852	·788229	769003	·648403	862236	·440093
	611404		537409		404688	
	207916		159880		105654	
	11		1		20	
90	540183	·346883	466293	·292613	372598	·235830
	634325	·905858	662460	·803833	710611	·661987
	672403		626947		552952	
	256479		213917		164083	
	26		13		27	
89	563233	·365791	503337	·318667	427673	·267715

ponding positions in the two compartments of the formation just given. The joint-life annuities also, with which we have to do, occupy positions corresponding to the others in the formation on pp. l, li.

Thus, to verify the rows opposite 92 :—

92·92	92·93	92·94	92·95	92·96	92·97
476990	534078	599527	670603	742292	800332
476990	422532	360285	292917	225212	170541
·953980	·956610	·959812	·963520	·967504	·970873

The annuity values are :—

·5800	·4898	·3798	·2524	·1157	·0000

and Orchard's Table gives for the corresponding assurances :—

·95398	·95661	·95982	·96352	·96751	·97087

This will no doubt be considered a sufficiently close correspondence between the two sets of values. The two formations will, however, stand a yet severer test. If we determine the assurances from the annuities by the formula,

$$A_{x \cdot y} = 1 - (1 - v)(1 + a_{x \cdot y}),$$

(log $(1 + a_{x \cdot y})$ being found in the annuity formation,) we obtain,

0·198668	0·173120	0·139815	0·097745	0·047538	0·000000
$\bar{2}$·464284	$\bar{2}$·464284	$\bar{2}$·464284	$\bar{2}$·464284	$\bar{2}$·464284	$\bar{2}$·464284
$\bar{2}$·662952	$\bar{2}$·637404	$\bar{2}$·604099	$\bar{2}$·562029	$\bar{2}$·511822	$\bar{2}$·464284
·046021	·043391	·040188	·036478	·032495	·029126
·953979	·956609	·959812	·963522	·967505	·970874

and we have now an all but perfect agreement in the sixth place.

This method of verification will be available when the work is undertaken by a single computer; but it may also be occasionally had recourse to when the work is done in duplicate.

The final arrangement of the results will be analogous to that of the annuity values, pp. 141, &c.; and they will occupy the entire quadrangular space. The values in which $x = y$ will take their places in the diagonal of the quadrilateral; and, if the values of x be put at the top and those of y at the side, the values of the function which occupy the rows in the first compartment of the formation will here take their places, *also in rows*, above the diagonal, while those that occupy the rows in the second compartment, will take their places *in columns* below the diagonal.

This will be understood by reference to the following specimen of the final arrangement:—

Values of Assurance of a Unit, on (x) against (y).
(x at the top, y at the side.)

y *	92 *	93 *	94 *	95 *	96 *	97 *	y *
*	*	*	*	*	*	*	*
89	·58348	·63447	·68979				89
90	·55402	·60719	·66551	·72674			90
1	·51891	·57425	·63567	·70154	·76670		1
2	·47699	·53408	·59953	·67060	·74229	·80033	2
3	·42253	·47932	·54715	·62365	·70328	·76904	3
4	·36029	·41408	·48155	.56184	·64965	·72461	4
95	·29292	·34070	40365	·48351	·57730	·66163	95
6	·22521	·26456	·31866	·39169	·48496	·57460	6
7	·17054	·20183	·24626	·30924	·39627	·48544	7

The specimen forms the concluding portion of the last six columns. It is composed of the values formed in the examples on pp. lxxx to lxxxiii.

Enough has now been done, in regard to the function under consideration, to enable any one, otherwise qualified for the task, easily to complete the three per-cent. formation, or to undertake the like at either of the other rates of three-and-a-half and four per-cent.

It does not seem too much to expect that among the younger members of the profession, who hope yet to occupy higher positions in it, there are to be found some who, recognising the claim their profession has upon them, as so well set forth in the passage from Bacon which forms the motto of the *Journal*,* are willing to devote a portion of their spare

* "I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of mends to be a help and ornament thereunto."

time to the extension of the deductions from the tables which have, at the cost of so much time, labour, and expense, been prepared and put forth by the Institute. Such a course would be remunerative in various ways:—First, it would beget the satisfaction arising from the discharge of a duty which, by hypothesis, they feel to be incumbent upon them. Secondly, it would lighten and facilitate their labours when they come to occupy the positions to which they aspire, by increasing the stock of material required for the proper and satisfactory conduct of their business; and, thirdly, it would operate to their more immediate advantage by imparting to them a dexterity in manipulation and a confidence in the use of tables not easily acquired by other means.

The present Introduction has grown to what it is feared will be considered by many, an undue length. The object mainly kept in view in its preparation has been, to show with what facility, by proper arrangement, and with the aid of the materials contained in the present volume, the tables required for actuarial use may be constructed: it is hoped that it will be found to contain little which does not bear more or less closely on that object.

P. G.

EXPLANATION

OF THE

ADJUSTMENT OF THE TABLES.

BY

W. S. B. WOOLHOUSE.

The Experience Committee having intimated a desire that I should adjust the graduation of the Tables of Mortality for Healthy Lives, the task undertaken by me is completed, and, for the information of the Committee, it only remains to accompany the resulting Tables by an explanation of the details of what has been done. The subject being one of very great practical importance, inasmuch as the adjusted tables are designed to form the basis of an extensive superstructure of other tables, I have given to it a careful and independent consideration, and, after testing various schemes, I have at length succeeded in devising a method that may be regarded as efficient and satisfactory.

As suggested in my paper* "On the Construction of Tables of Mortality," the number-living at each age is the most manageable element for final adjustment; at ages beyond the limiting age of the Table it is at once conveniently, as well as accurately, put down as zero, a practical facility that cannot be over-estimated; and it has this essential advan-

* *Journal*, vol. xiii., p. 95.

tage, that precisely the same aggregate tabular mortality or decrement must necessarily be retained between all points of actual coincidence, in whatever way the intermediate numbers may be modified. As a consequence of this principle the number of such coincidences with experience in the curve of the number-living may be regarded as one test of close adjustment and substantial exhibition of the actual mortality. The method I have adopted may be briefly stated, and the rationale of the process and its accurate adaptation to what is chiefly required will be at once apparent.

The data, for the reasons already stated, are the numbers-living at successive years of age as deduced, without any adjustment, from the original facts. If we begin at the first age in the Table and extract the numbers-living at quinquennial intervals, that is, according to the usual notation, l_{10}, l_{15}, l_{20}, l_{25}, ... we can by the formula for interpolation determine all the intermediate values at the other ages, and so obtain a complete series of values that shall be continuous. Geometrically speaking, we shall thus pass a continuous curve-line through the indicated quinquennial points. Against the adoption of such curve-line as the basis of the final Table there is manifestly this tangible objection, that the numbers at the ages 10, 15, 20, 25, ... are made use of exclusively, and that the original numbers between these ages are wholly ignored as data. This rather material objection, which is inherent in other methods of adjustment, is entirely removed by varying the epoch of the adopted quinquennial data, that is, by taking the five distinct series hereunder stated, viz.:—

$$l_{10},\ l_{15},\ l_{20},\ l_{25},\ \ldots.$$
$$l_{11},\ l_{16},\ l_{21},\ l_{26},\ \ldots.$$
$$l_{12},\ l_{17},\ l_{22},\ l_{27},\ \ldots.$$
$$l_{13},\ l_{18},\ l_{23},\ l_{28},\ \ldots.$$
$$l_{14},\ l_{19},\ l_{24},\ l_{29},\ \ldots.$$

then by separately interpolating the intermediate values for each of these series, and by finally taking the arithmetical average, or mean value, of the five completed sets of results, the series of adjusted values is obtained.

Reverting again to a graphical illustration, all the points of the original data are thus occupied by five distinct curves, assimilating to the experience and to one another, and forming in combination a sort of network; and at every age the resulting ordinate of the adjusted curve is the arithmetical mean of the five corresponding ordinates, and, in other words, the five curves are, as it were, mutually drawn in towards a central course. That such central curve must exhibit a correct average of the original observations without giving undue weight to any of them, it is unnecessary to explain, and it will be at once perceived that every element of the data is equally employed in its determination.

It is not requisite, however, to compute these five curves separately, a labour which would be unnecessarily circuitous. For the purpose of actual calculation we proceed mathematically to reduce the preceding system of operations to a direct process.

For any given age let l denote an interpolated value of the number living, and let l_z, which denotes the original number for an age z years older, be the nearest quinquennial point of the corresponding curve. Then the series of values from which l is found are l_{z-5}, l_z, l_{z+5}, &c., and by interpolating with central values and stopping after second-differences, we shall have

$$l=l_z-\left(\frac{z}{5}\right)a+\left(\frac{z}{5}\right)^2\frac{b}{2}$$

$$=l_z-\left(\frac{z}{5}\right)\frac{l_{z+5}-l_{z-5}}{2}+\left(\frac{z}{5}\right)^2\frac{l_{z-5}-2l_z+l_{z+5}}{2}$$

$$=\frac{z(5+z)}{50}l_{z-5}+\frac{25-z^2}{25}l_z-\frac{z(5-z)}{50}l_{z+5}.$$

For the several values of l as deduced from the five respective curves we must make z separately equal to $-2, -1, 0, 1, 2$. The five values of l are therefore

$$\begin{aligned}
l &= -\cdot12l_{-7}+\cdot84l_{-2}+\cdot28l_{+3}\\
l &= -\cdot08l_{-6}+\cdot96l_{-1}+\cdot12l_{+4}\\
l &= \quad 0 \quad + \quad l \quad + \quad 0\\
l &= +\cdot12l_{-4}+\cdot96l_{+1}-\cdot08l_{+6}\\
l &= +\cdot28l_{-3}+\cdot84l_{+2}-\cdot12l_{+7}
\end{aligned}$$

Hence if we put

$$\left.\begin{aligned}
\gamma_1=l_{-1}+l_{+1},\ \gamma_2=l_{-2}+l_{+2},\ \gamma_3=l_{-3}+l_{+3}\\
\gamma_4=l_{-4}+l_{+4},\ \gamma_6=l_{-6}+l_{+6},\ \gamma_7=l_{-7}+l_{+7}
\end{aligned}\right\}\quad . \quad . \quad (a)$$

$$f=\gamma_1-\gamma_3,\ g=\gamma_2-\gamma_3,\ h=\gamma_6-\gamma_3,\ k=\gamma_7-\gamma_4 \quad . \quad . \quad (\beta)$$

and if (l) denote the required average number-living at the given age, we shall have by adding together the five values of l,

$$5(l)=l+\cdot96\gamma_1+\cdot84\gamma_2+\cdot28\gamma_3+\cdot12\gamma_4-\cdot08\gamma_6-\cdot12\gamma_7$$
$$=l+\gamma_1+\gamma_2-\cdot04\{(\gamma_1-\gamma_3)+4(\gamma_2-\gamma_3)+2(\gamma_6-\gamma_3)+3(\gamma_7-\gamma_4)\}$$
$$=l+\gamma_1+\gamma_2-\cdot04(f+4g+2h+3k) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (\gamma)$$

By means of these last formulæ, (α), (β), (γ), the required adjusted values of the numbers-living are readily computed.

Example. In the Table $\mathbf{H^M}$, Healthy Lives—Male, it is required to find the adjusted value of l for age 25.

The data are taken from "The Mortality Experience," Table $\mathbf{H^M}$, page 273, and the calculation *in extenso* is annexed:—

	1	2	3	4	6	7
(25) l 9297	l_{-1} 9361	l_{-2} 9434	l_{-3} 9493	l_{-4} 9560	l_{-6} 9684	l_{-7} 9743
γ_1 18610	l_{+1} 9249	l_{+2} 9185	l_{+3} 9125	l_{+4} 9054	l_{+6} 8913	l_{+7} 8848
γ_2 18619	γ_1 18610	γ_2 18619	γ_3 18618	γ_4 18614	γ_6 18597	γ_7 18591
46526	γ_3 18618	γ_3 18618	$2h$ − 42		γ_3 18618	γ_4 18614
Corr^n + 4·60	f − 8	g + 1	$3k$ − 69		h − 21	k − 23
5)46530·60	$4g$ + 4		− 111			
(l) 93061	− 4	....	− 4			
			− 115	× − ·04	= + 4·60	Corr^n

In filling in the data the computer will bear in mind that a chasm precedes the last two columns, and that l_{-5} and l_{+5} are there passed over unheeded. This is further indicated by the numerals placed at the top of the respective columns. It will be further observed that the final result is here put down and retained to an extra place of figures.

Since the expression (γ) is linear with respect to the several values of l, it is evident that precisely the same formulæ may be applied to adjust the yearly decrements, and these being much smaller numbers the calculation of the table may be thus considerably abbreviated and expedited, the numbers-living being then deduced by the successive subtraction of the adjusted decrements. The adjustment of the decrements undoubtedly offers the greatest possible facility.

As an example, taking the same Table as before, the following is the calculation of the adjusted decrement (d) at age 25:—

	1	2	3	4	6	7
(25)						
d 48	d_{-1} 64	d_{-2} 73	d_{-3} 59	d_{-4} 67	d_{-6} 68	d_{-7} 59
γ_1 128	d_{+1} 64	d_{+2} 60	d_{+3} 71	d_{+4} 67	d_{+6} 65	d_{+7} 74
γ_2 133	γ_1 128	γ_2 133	γ_3 130	γ_4 134	γ_6 133	γ_7 133
309	γ_3 130	...130	$2h$ +6		γ_3 130	γ_4 134
Corr^n – 0·52	f – 2	g +3	$3k$ – 3		h + 3	k – 1
5)308·48	$4g$ + 12		+3			
(d) 617	+10	. ....	... +10			
93061	(l) age 25		+13	× – ·04	= – 0·52	Corr^n
92444	(l) „ 26					

The resulting adjusted decrement 617 being here subtracted from 93061, the adjusted number-living at age 25, we obtain 92444 for the adjusted number-living at age 26.

In the actual construction of the Tables I have first made independent computations of the adjusted numbers-living for every fifth year of age, and afterwards calculated the values throughout for every age by adjusting the decrements, thence deducing by successive subtraction the numbers-living, and making use of the former calculations at each quinquennial stage, as a periodical check on the accuracy of the work. The final results, on being differenced to second-differences, are generally found to be remarkable for their orderly progression, though at exceptional places there may yet exist some slight traces of irregularity, but they are quite isolated, and so minute as to be readily amended by inspection.* The simplicity and efficiency of the manipulation will be duly appreciated by those who may hereafter have occasion to put it in practice.

Another matter incidental to the completion of the Table it will be requisite to explain. As the data for each separate calculation must extend over an interval of seven years preceding and following the age, the formulæ will obviously not apply to the first seven years of the Table, and the numbers for those years, viz., ages 10 to 16, will therefore be wanting. To effect a continuous junction at age 17, I have considered it most expedient to supply the required numbers by means of constant third-differences. At age 10, the radix of the table is $l_{10} = 100000$. If Δ_1, Δ_2, Δ_3 be the differences immediately following age 17, and $n = 7$, we shall have

* Those who are not practically familiar with progressions of differences, and the disturbances caused by isolated errors, need only have recourse to the elementary Rule given by me in a former paper, *Journal*, vol. xii, page 140.

$$l_{10}=l_{17}-n\Delta_1+\frac{n(n+1)}{2}\Delta_2-\frac{n(n+1)(n+2)}{2.3}\Delta_3$$
$$=l_{17}-7\Delta_1+28\Delta_2-84\Delta_3$$

from which

$$\Delta_3=\frac{\Delta_2}{3}-\frac{\Delta_1}{12}-\frac{l_{10}-l_{17}}{84}.$$

When the series of numbers is put down in a retrograde order, the differences that are of an odd order will change sign. In such case therefore we shall have to begin with l_{17}, and apply the three orders of differences after having reversed the signs of the first and third. The third-difference should be calculated to one or perhaps two additional places of figures, and then the continued summation of the differences will sufficiently check the accuracy of the computation.

The first calculated numbers of the **H**$^{\mathbf{M}}$ Table, beginning at age 17, with the accompanying differences, are

Age 17	97624		
		−379	
18	97245		−87
		−466	
19	96779		

Here we have $\Delta_1=-379$, $\Delta_2=-87$, and

$$\Delta_3=\frac{\Delta_2}{3}-\frac{\Delta_1}{12}-\frac{l_{10}-l_{17}}{84}$$
$$=-\frac{87}{3}+\frac{379}{12}-\frac{2376}{84}=-25{\cdot}70$$

Hence, changing the signs of the odd orders, the three commencing differences are $+379{\cdot}0$, $-87{\cdot}0$, $+25{\cdot}7$, and the retrograde calculation is as follows:—

	(l)		+25·7	$=\Delta_3$
			−87·0	
17	97624·0	+379·0	−61·3	
16	97941·7	317·7	−35·6	
15	98223·8	282·1	− 9·9	
14	98496·0	272·2	+15·8	
13	98784·0	288·0	+41·5	
12	99113·5	329·5	+67·2	
11	99510·2	396·7	+92·9	
10	99999·8	+489·6		

The column of second-differences is formed by the repeated addition of the constant third-difference placed above it, and the other columns are hence obtained by continued addition, or the inverse operation to that of differencing.

In conclusion it may be observed that in the method of adjustment here laid down and adopted, every individual element of the data supplied by the experience has its proper and legitimate influence in determining the several results, and that there does not exist anything of an arbitrary nature in the process. No extraneous condition or restriction is placed upon the quantities, which are freely permitted to manifest and assert their own law. In fact, if the original points, taken in groups, were to range in curves of the third order, they would in such case not be subject to any alteration whatever by the operation of adjustment. Thus the process, unlike other methods of adjustment, does not in any way interfere with the organic relations which exist amongst the true values but operates exclusively upon the incidental imperfections, whether in excess or defect, that is to say, its efficiency is wholly directed towards the neutralization of the small positive and negative portions of the data which constitute the errors of observation. Hence, also, if there should be any particular phases in the absolute law of mortality or any special peculiarities at certain periods of life, the same will be brought out with greater clearness and significance in the final Table, after the casual irregularities have been eliminated.

The adjustments have been separately made on the $\mathbf{H}^{M}$, $\mathbf{H}^{F}$ and $\mathbf{H}^{MF}$ Tables; and also on an $\mathbf{H}^{M(5)}$ Table, excluding the first five years of assurance, this last Table being designed for the general purposes of valuations.

H^{M}.

Healthy Lives.—Male.—Adjusted Table.

Age x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $=\Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
10	100 000	490	5·000 000 0	9·997 866 7	·995 100 0	·004 900 0
1	99 510	397	4·997 866 7	9·998 263 9	·996 010 5	·003 989 5
2	99 113	329	4·996 130 6	9·998 556 0	·996 680 6	·003 319 4
3	98 784	288	4·994 686 6	9·998 732 0	·997 084 5	·002 915 5
4	98 496	272	4·993 418 6	9·998 799 0	·997 238 5	·002 761 5
15	98 224	282	4·992 217 6	9·998 751 4	·997 129 0	·002 871 0
6	97 942	318	4·990 969 0	9·998 587 6	·996 753 2	·003 246 8
7	97 624	379	4·989 556 6	9·998 310 7	·996 117 8	·003 882 2
8	97 245	466	4·987 867 3	9·997 913 8	·995 208 0	·004 792 0
9	96 779	556	4·985 781 1	9·997 497 8	·994 255 0	·005 745 0
20	96 223	609	4·983 278 9	9·997 242 6	·993 671 0	·006 329 0
1	95 614	643	4·980 521 5	9·997 069 5	·993 275 0	·006 725 0
2	94 971	650	4·977 591 0	9·997 017 4	·993 155 8	·006 844 2
3	94 321	638	4·974 608 4	9·997 052 4	·993 235 9	·006 764 1
4	93 683	622	4·971 660 8	9·997 106 9	·993 360 6	·006 639 4
25	93 061	617	4·968 767 7	9·997 111 0	·993 369 9	·006 630 1
6	92 444	618	4·965 878 7	9·997 087 0	·993 314 9	·006 685 1
7	91 826	634	4·962 965 7	9·996 991 0	·993 095 6	·006 904 4
8	91 192	654	4·959 956 7	9·996 874 2	·992 828 3	·007 171 7
9	90 538	673	4·956 830 9	9·996 759 7	·992 566 7	·007 433 3
30	89 865	694	4·953 590 6	9·996 633 0	·992 277 3	·007 722 7
1	89 171	706	4·950 223 6	9·996 547 9	·992 082 6	·007 917 4
2	88 465	717	4·946 771 5	9·996 465 7	·991 895 1	·008 104 9
3	87 748	727	4·943 237 2	9·996 386 9	·991 714 9	·008 285 1
4	87 021	740	4·939 624 1	9·996 291 1	·991 496 3	·008 503 7
35	86 281	757	4·935 915 2	9·996 172 8	·991 226 3	·008 773 7
6	85 524	779	4·932 088 0	9·996 026 1	·990 891 4	·009 108 6
7	84 745	802	4·928 114 1	9·995 870 4	·990 536 3	·009 463 7
8	83 943	821	4·923 984 5	9·995 731 5	·990 219 6	·009 780 4
9	83 122	838	4·919 716 0	9·995 599 4	·989 918 4	·010 081 6
40	82 284	848	4·915 315 4	9·995 501 0	·989 694 2	·010 305 8
1	81 436	854	4·910 816 4	9·995 421 6	·989 513 2	·010 486 8
2	80 582	865	4·906 238 0	9·995 312 9	·989 265 6	·010 734 4
3	79 717	887	4·901 550 9	9·995 140 6	·988 873 1	·011 126 9
4	78 830	911	4·896 691 5	9·994 951 9	·988 443 5	·011 556 5
45	77 919	950	4·891 643 4	9·994 672 4	·987 807 9	·012 192 1
6	76 969	996	4·886 315 8	9·994 343 5	·987 059 7	·012 940 3
7	75 973	1041	4·880 659 3	9·994 008 0	·986 297 8	·013 702 2
8	74 932	1082	4·874 667 3	9·993 683 2	·985 560 2	·014 439 8
9	73 850	1124	4·868 350 5	9·993 339 2	·984 780 0	·015 220 0
50	72 726	1160	4·861 689 7	9·993 017 0	·984 049 7	·015 950 3
1	71 566	1193	4·854 706 7	9·992 699 4	·983 330 1	·016 669 9
2	70 373	1235	4·847 406 1	9·992 310 7	·982 450 7	·017 549 3
3	69 138	1286	4·839 716 8	9·991 845 9	·981 399 5	·018 600 5
4	67 852	1339	4·831 562 7	9·991 343 8	·980 265 9	·019 734 1

H^M.

Healthy Lives —Male.—Adjusted Table.

Age. x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $= \Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
55	66 513	1399	4·822 906 5	9·990 767 9	·978 966 5	.021 033 5
6	65 114	1462	4·813 674 4	9·990 137 7	·977 547 1	·022 452 9
7	63 652	1527	4·803 812 1	9·989 454 3	·976 010 2	·023 989 8
8	62 125	1592	4·793 266 4	9·988 725 8	·974 374 2	·025 625 8
9	60 533	1667	4·781 992 2	9·987 872 3	·972 461 3	·027 538 7
60	58 866	1747	4·769 864 5	9·986 916 1	·970 322 4	·029 677 6
1	57 119	1830	4·756 780 6	9·985 858 1	·967 961 6	·032 038 4
2	55 289	1915	4·742 638 7	9·984 691 1	·965 363 8	·034 636 2
3	53 374	2001	4·727 329 8	9·983 405 1	·962 509 8	·037 490 2
4	51 373	2076	4·710 734 9	9·982 085 6	·959 589 7	·040 410 3
65	49 297	2141	4·692 820 5	9·980 716 5	·956 569 4	·043 430 6
6	47 156	2196	4·673 537 0	9·979 289 3	·953 431 2	·046 568 8
7	44 960	2243	4·652 826 3	9·977 774 4	·950 111 2	·049 888 8
8	42 717	2274	4·630 600 7	9·976 242 7	·946 765 9	·053 234 1
9	40 443	2319	4·606 843 4	9·974 355 1	.942 660 0	·057 340 0
70	38 124	2371	4·581 198 5	9·972 114 0	·937 808 2	·062 191 8
1	35 753	2433	4·553 312 5	9·969 392 5	·931 949 8	·068 050 2
2	33 320	2497	4·522 705 0	9·966 169 9	·925 060 0	·074 940 0
3	30 823	2554	4·488 874 9	9·962 435 5	·917 139 8	·082 860 2
4	28 269	2578	4·451 310 4	9·958 470 6	·908 804 7	·091 195 3
75	25 691	2527	4·409 781 0	9·955 032 6	·901 638 7	·098 361 3
6	23 164	2464	4·364 813 6	9·951 156 7	·893 628 1	·106 371 9
7	20 700	2374	4·315 970 3	9·947 097 4	·885 314 0	·114 686 0
8	18 326	2258	4·263 067 7	9·942 894 1	·876 787 1	·123 212 9
9	16 068	2138	4·205 961 8	9·937 989 3	·866 940 5	·133 059 5
80	13 930	2015	4·143 951 1	9·932 142 9	·855 348 1	·144 651 9
1	11 915	1883	4·076 094 0	9·925 293 5	·841 963 9	·158 036 1
2	10 032	1719	4·001 387 5	9·918 370 3	·828 648 3	·171 351 7
3	8 313	1545	3·919 757 8	9·910 702 6	·814 146 5	·185 853 5
4	6 768	1346	3·830 460 4	9·903 699 1	·801 122 9	·198 877 1
85	5 422	1138	3·734 159 5	9·897 690 0	·790 114 3	·209 885 7
6	4 284	941	3·631 849 5	9·892 286 9	·780 345 5	·219 654 5
7	3 343	773	3·524 136 4	9·885 796 7	·768 770 6	·231 229 4
8	2 570	615	3·409 933 1	9·881 213 7	·760 700 4	·239 299 6
9	1 955	495	3·291 146 8	9·873 206 1	·746 803 1	·253 196 9
90	1 460	408	3·164 352 9	9·857 662 8	·720 547 9	·279 452 1
1	1 052	329	3·022 015 7	9·837 122 6	·687 262 3	·312 737 7
2	723	254	2·859 138 3	9·812 034 5	·648 686 0	·351 314 0
3	469	195	2·671 172 8	9·766 577 8	·584 221 7	·415 778 3
4	274	139	2·437 750 6	9·692 583 2	·492 700 8	·507 299 2
95	135	86	2·130 333 8	9·559 862 3	·362 962 9	·637 037 1
6	49	40	1·690 196 1	9·264 046 4	·183 673 5	·816 326 5
7	9	9	0·954 242 5	$-\infty$	·000 000 0	1·000 000 0
8	0		$-\infty$			

Hᶠ.

Healthy Lives.—Female.—Adjusted Table.

Age x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $=\Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
10	100 000	314	5·000 000 0	9·998 634 2	·996 860 0	·003 140 0
1	99 686	420	4·998 634 2	9·998 166 3	·995 786 8	·004 213 2
2	99 266	510	4·996 800 5	9·997 763 0	·994 862 3	·005 137 7
3	98 756	581	4·994 563 5	9·997 437 4	·994 116 8	·005 883 2
4	98 175	632	4·992 000 9	9·997 195 2	·993 562 5	·006 437 5
15	97 543	667	4·989 196 1	9·997 020 1	·993 162 0	·006 838 0
6	96 876	683	4·986 216 2	9·996 927 3	·992 949 8	·007 050 2
7	96 193	680	4·983 143 5	9·996 919 0	·992 930 9	·007 069 1
8	95 513	659	4·980 062 5	9·996 993 1	·993 100 4	·006 899 6
9	94 854	635	4·977 055 6	9·997 082 9	·993 305 5	·006 694 5
20	94 219	648	4·974 138 5	9·997 002 8	·993 122 4	·006 877 6
1	93 571	682	4·971 141 3	9·996 823 0	·992 711 4	·007 288 6
2	92 889	736	4·967 964 3	9·996 545 2	·992 076 6	·007 923 4
3	92 153	813	4·964 509 5	9·996 151 5	·991 177 7	·008 822 3
4	91 340	899	4·960 661 0	9·995 704 4	·990 157 7	·009 842 3
25	90 441	978	4·956 365 4	9·995 278 1	·989 186 3	·010 813 7
6	89 463	1018	4·951 643 5	9·995 029 8	·988 621 0	·011 379 0
7	88 445	1045	4·946 673 3	9·994 838 1	·988 184 7	·011 815 3
8	87 400	1050	4·941 511 4	9·994 750 9	·987 986 3	·012 013 7
9	86 350	1032	4·936 262 3	9·994 778 4	·988 048 6	·011 951 4
30	85 318	1011	4·931 040 7	9·994 822 9	·988 150 2	·011 849 8
1	84 307	987	4·925 863 6	9·994 885 7	·988 292 8	·011 707 2
2	83 320	964	4·920 749 3	9·994 945 9	·988 430 2	·011 569 8
3	82 356	960	4·915 695 2	9·994 907 9	·988 343 3	·011 656 7
4	81 396	954	4·910 603 1	9·994 879 8	·988 279 5	·011 720 5
35	80 442	946	4·905 482 9	9·994 862 4	·988 240 0	·011 760 0
6	79 496	946	4·900 345 3	9·994 800 9	·988 100 0	·011 900 0
7	78 550	946	4·895 146 2	9·994 737 9	·987 956 7	·012 043 3
8	77 604	946	4·889 884 1	9·994 673 4	·987 809 9	·012 190 1
9	76 658	946	4·884 557 5	9·994 607 2	·987 659 5	·012 340 5
40	75 712	950	4·879 164 7	9·994 516 2	·987 452 5	·012 547 5
1	74 762	953	4·873 680 9	9·994 428 4	·987 252 9	·012 747 1
2	73 809	955	4·868 109 3	9·994 344 1	·987 061 2	·012 938 8
3	72 854	958	4·862 453 4	9·994 251 3	·986 850 4	·013 149 6
4	71 896	962	4·856 704 7	9·994 149 8	·986 619 6	·013 380 4
45	70 934	966	4·850 854 5	9·994 045 0	·986 381 7	·013 618 3
6	69 968	963	4·844 899 5	9·993 981 1	·986 236 6	·013 763 4
7	69 005	958	4·838 880 6	9·993 928 4	·986 116 9	·013 883 1
8	68 047	953	4·832 809 0	9·993 874 7	·985 995 0	·014 005 0
9	67 094	950	4·826 683 7	9·993 806 8	·985 840 8	·014 159 2
50	66 144	956	4·820 490 5	9·993 677 2	·985 546 7	·014 453 3
1	65 188	975	4·814 167 7	9·993 455 3	·985 043 3	·014 956 7
2	64 213	1003	4·807 623 0	9·993 162 8	·984 380 1	·015 619 9
3	63 210	1037	4·800 785 8	9·992 816 0	·983 594 4	·016 405 6
4	62 173	1081	4·793 601 8	9·992 382 5	·982 613 0	·017 387 0

H^F.

Healthy Lives.—Female.—Adjusted Table.

Age. x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $=\Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
55	61 092	1116	4·785 984 3	9·991 993 2	·981 732 5	·018 267 5
6	59 976	1144	4·777 977 5	9·991 636 1	·980 925 7	·019 074 3
7	58 832	1170	4·769 613 6	9·991 276 1	·980 112 9	·019 887 1
8	57 662	1196	4·760 889 7	9·990 897 3	·979 258 4	·020 741 6
9	56 466	1231	4·751 787 0	9·990 427 4	·978 199 3	·021 800 7
60	55 235	1308	4·742 214 4	9·989 591 9	·976 319 4	·023 680 6
1	53 927	1395	4·731 806 3	9·988 617 6	·974 131 7	·025 868 3
2	52 532	1495	4·720 423 9	9·987 461 2	·971 541 2	·028 458 8
3	51 037	1601	4·707 885 1	9·986 158 2	·968 630 6	·031 369 4
4	49 436	1706	4·694 043 3	9·984 741 8	·965 490 7	·034 509 3
65	47 730	1784	4·678 791 4	9·983 456 3	·962 623 1	·037 376 9
6	45 946	1846	4·662 247 7	9·982 190 9	·959 822 4	·040 177 6
7	44 100	1914	4·644 438 6	9·980 729 7	·956 598 6	·043 401 4
8	42 186	1982	4·625 168 3	9·979 101 0	·953 017 6	·046 982 4
9	40 204	2050	4·604 269 3	9·977 270 8	·949 010 0	·050 990 0
70	38 154	2123	4·581 540 1	9·975 136 2	·944 357 1	·055 642 9
1	36 031	2232	4·556 676 3	9·972 227 6	·938 053 3	·061 946 7
2	33 799	2338	4·528 903 9	9·968 868 6	·930 826 4	·069 173 6
3	31 461	2425	4·497 772 5	9·965 164 3	·922 920 4	·077 079 6
4	29 036	2490	4·462 936 8	9·961 062 3	·914 244 4	·085 755 6
75	26 546	2518	4·423 999 1	9·956 718 5	·905 145 8	·094 854 2
6	24 028	2500	4·380 717 6	9·952 286 1	·895 954 7	·104 045 3
7	21 528	2363	4·333 003 7	9·949 505 1	·890 236 0	·109 764 0
8	19 165	2205	4·282 508 8	9·946 917 0	·884 946 5	·115 053 5
9	16 960	2024	4·229 425 8	9·944 808 5	·880 660 4	·119 339 6
80	14 936	1819	4·174 234 3	9·943 600 2	·878 213 7	·121 786 3
1	13 117	1621	4·117 834 5	9·942 712 3	·876 419 9	·123 580 1
2	11 496	1514	4·060 546 8	9·938 670 8	·868 302 0	·131 698 0
3	9 982	1450	3·999 217 6	9·931 833 2	·854 738 5	·145 261 5
4	8 532	1389	3·931 050 8	9·922 829 9	·837 201 1	·162 798 9
85	7 143	1326	3·853 880 7	9·910 818 4	·814 363 8	·185 636 2
6	5 817	1234	3·764 699 1	9·896 450 8	·787 863 2	·212 136 8
7	4 583	1086	3·661 149 9	9·882 545 7	·763 037 3	·236 962 7
8	3 497	903	3·543 695 6	9·870 274 4	·741 778 6	·258 221 4
9	2 594	707	3·413 970 0	9·861 801 9	·727 448 0	·272 552 0
90	1 887	519	3·275 771 9	9·860 314 2	·724 960 3	·275 039 7
1	1 368	368	3·136 086 1	9·863 913 9	·730 994 2	·269 005 8
2	1 000	232	3·000 000 0	9·885 361 2	·768 000 0	·232 000 0
3	768	138	2·885 361 2	9·913 979 3	·820 312 5	·179 687 5
4	630	117	2·799 340 5	9·910 776 9	·814 285 7	·186 714 3
95	513	107	2·710 117 4	9·898 408 6	·791 423 0	·208 577 0
6	406	104	2·608 526 0	9·871 480 9	·743 842 4	·256 157 6
7	302	102	2·480 006 9	9·821 023 1	·662 251 6	·337 748 4
8	200	100	2·301 030 0	9·698 970 0	·500 000 0	.500 000 0
9	100	100	2·000 000 0	$-\infty$	·000 000 0	1·000 000 0
100	0		$-\infty$			

H^{MF}.

Healthy Lives.—Male and Female.—Adjusted Table.

Age x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $=\Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
10	100 000	442	5·000 000 0	9·998 076 2	·995 580 0	·004 420 0
1	99 558	407	4·998 076 2	9·998 220 9	·995 911 9	·004 088 1
2	99 151	385	4·996 297 1	9·998 310 4	·996 117 0	·003 883 0
3	98 766	376	4·994 607 5	9·998 343 5	·996 193 0	·003 807 0
4	98 390	379	4·992 951 0	9·998 323 8	·996 148 0	·003 852 0
15	98 011	396	4·991 274 8	9·998 241 8	·995 959 6	·004 040 4
6	97 615	426	4·989 516 6	9·998 100 5	·995 635 9	·004 364 1
7	97 189	469	4·987 617 1	9·997 899 2	·995 174 4	·004 825 6
8	96 720	525	4·985 516 3	9·997 636 2	·994 572 0	·005 428 0
9	96 195	581	4·983 152 5	9·997 369 0	·993 960 2	·006 039 8
20	95 614	621	4·980 521 5	9·997 170 1	·993 505 1	·006 494 9
1	94 993	645	4·977 691 6	9·997 041 1	·993 210 0	·006 790 0
2	94 348	653	4·974 732 7	9·996 983 7	·993 078 8	·006 921 2
3	93 695	651	4·971 716 4	9·996 972 0	·993 051 9	·006 948 1
4	93 044	647	4·968 688 4	9·996 969 5	·993 046 3	·006 953 7
25	92 397	647	4·965 657 9	9·996 948 2	·992 997 6	·007 002 4
6	91 750	651	4·962 606 1	9·996 907 5	·992 904 6	·007 095 4
7	91 099	668	4·959 513 6	9·996 803 7	·992 667 3	·007 332 7
8	90 431	686	4·956 317 3	9·996 693 0	·992 414 1	·007 585 9
9	89 745	703	4·953 010 3	9·996 584 6	·992 166 7	·007 833 3
30	89 042	718	4·949 594 9	9·996 483 8	·991 936 4	·008 063 6
1	88 324	726	4·946 078 7	9·996 415 5	·991 780 3	·008 219 7
2	87 598	733	4·942 494 2	9·996 350 6	·991 632 2	·008 367 8
3	86 865	743	4·938 844 8	9·996 269 3	·991 446 5	·008 553 5
4	86 122	754	4·935 114 1	9·996 181 0	·991 245 0	·008 755 0
35	85 368	768	4·931 295 1	9·996 075 3	·991 003 7	·008 996 3
6	84 600	789	4·927 370 4	9·995 930 6	·990 673 8	·009 326 2
7	83 811	811	4·923 301 0	9·995 777 1	·990 323 5	·009 676 5
8	83 000	830	4·919 078 1	9·995 635 2	·990 000 0	·010 000 0
9	82 170	844	4·914 713 3	9·995 516 1	·989 728 6	·010 271 4
40	81 326	854	4·910 229 4	9·995 415 4	·989 499 1	·010 500 9
1	80 472	860	4·905 644 8	9·995 333 7	·989 313 1	·010 686 9
2	79 612	869	4·900 978 5	9·995 233 5	·989 084 6	·010 915 4
3	78 743	888	4·896 212 0	9·995 074 5	·988 722 8	·011 277 2
4	77 855	913	4·891 286 5	9·994 877 0	·988 273 1	·011 726 9
45	76 942	948	4·886 163 5	9·994 615 8	·987 679 0	·012 321 0
6	75 994	989	4·880 779 3	9·994 310 9	·986 985 8	·013 014 2
7	75 005	1029	4·875 090 2	9·994 000 6	·986 280 9	·013 719 1
8	73 976	1067	4·869 090 8	9·993 690 3	·985 576 4	·014 423 6
9	72 909	1102	4·862 781 1	9·993 385 7	·984 885 3	·015 114 7
50	71 807	1133	4·856 166 8	9·993 092 9	·984 221 6	·015 778 4
1	70 674	1167	4·849 259 7	9·992 768 8	·983 487 6	·016 512 4
2	69 507	1204	4·842 028 5	9·992 411 3	·982 678 0	·017 322 0
3	68 303	1251	4·834 439 8	9·991 971 9	·981 684 6	·018 315 4
4	67 052	1304	4·826 411 7	9·991 470 8	·980 552 4	·019 447 6

H^MF.

Healthy Lives.—Male and Female.—Adjusted Table.

Age x	No. Living. l_x	Decrement. d_x	Log l_x	Log p_x $=\Delta \log l_x$	Prob. Surviving 1 Year. p_x	Prob. Dying in 1 Year. q_x
55	65 748	1358	4·817 882 5	9·990 935 9	·979 345 4	·020 654 6
6	64 390	1414	4·808 818 4	9·990 356 7	·978 040 1	·021 959 9
7	62 976	1471	4·799 175 1	9·989 735 3	·976 641 9	·023 358 1
8	61 505	1531	4·788 910 4	9·989 052 6	·975 107 7	·024 892 3
9	59 974	1601	4·777 963 0	9·988 249 0	·973 305 1	·026 694 9
60	58 373	1677	4·766 212 0	9·987 340 4	·971 271 0	·028 729 0
1	56 696	1760	4·753 552 4	9·986 304 6	·968 957 2	·031 042 8
2	54 936	1849	4·739 857 0	9·985 131 2	·966 342 7	·033 657 3
3	53 087	1936	4·724 988 2	9·983 865 9	·963 531 6	·036 468 4
4	51 151	2014	4·708 854 1	9·982 554 5	·960 626 4	·039 373 6
65	49 137	2080	4·691 408 6	9·981 215 6	·957 669 4	·042 330 6
6	47 057	2138	4·672 624 2	9·979 805 9	·954 565 7	·045 434 3
7	44 919	2186	4·652 430 1	9·978 333 3	·951 334 6	·048 665 4
8	42 733	2224	4·630 763 4	9·976 788 1	·947 955 9	·052 044 1
9	40 509	2268	4·607 551 5	9·974 977 7	·944 012 4	·055 987 6
70	38 241	2331	4·582 529 2	9·972 686 2	·939 044 5	·060 955 5
1	35 910	2401	4·555 215 4	9·969 946 1	·933 138 4	·066 861 6
2	33 509	2469	4.525 161 5	9·966 760 2	·926 318 3	·073 681 7
3	31 040	2531	4·491 921 7	9·963 060 3	·918 460 0	·081 540 0
4	28 509	2567	4·454 982 0	9·959 021 5	·909 958 3	·090 041 7
75	25 942	2542	4·414 003 5	9·955 212 4	·902 012 2	·097 987 8
6	23 400	2476	4·369 215 9	9·951 428 8	·894 188 1	·105 811 9
7	20 924	2369	4·320 644 7	9·947 816 3	·886 780 7	·113 219 3
8	18 555	2247	4·268 461 0	9·943 939 7	·878 900 6	·121 099 4
9	16 308	2110	4·212 400 7	9·939 826 5	·870 615 6	·129 384 4
80	14 198	1969	4·152 227 2	9·935 163 7	·861 318 5	·138 681 5
1	12 229	1823	4·087 390 9	9·929 892 9	·850 928 1	·149 071 9
2	10 406	1672	4·017 283 8	9·923 929 4	·839 323 4	·160 676 6
3	8 734	1522	3·941 213 2	9·916 842 5	·825 738 5	·174 261 5
4	7 212	1360	3·858 055 7	9·909 248 6	·811 425 4	·188 574 6
85	5 852	1186	3·767 304 3	9·901 640 4	·797 334 2	·202 665 8
6	4 666	1014	3·668 944 7	9·893 586 1	·782 683 2	·217 316 8
7	3 652	849	3·562 530 8	9·885 092 3	·767 524 7	·232 475 3
8	2 803	689	3·447 623 1	9·877 481 9	·754 191 9	·245 808 1
9	2 114	548	3·325 105 0	9·869 686 8	·740 775 8	·259 224 2
90	1 566	435	3·194 791 8	9·858 670 8	·722 222 2	·277 777 8
1	1 131	336	3·053 462 6	9·846 904 5	·702 917 7	·297 082 3
2	795	247	2·900 367 1	9·838 413 5	·689 308 1	·310 691 9
3	548	181	2·738 780 6	9·825 885 5	·669 708 0	·330 292 0
4	367	131	2·564 666 1	9·808 245 9	·643 051 8	·356 948 2
95	236	86	2·372 912 0	9·803 179 3	·635 593 2	·364 406 8
6	150	56	2·176 091 3	9·797 036 6	·626 666 7	·373 333 3
7	94	44	1·973 127 9	9·725 842 1	·531 914 9	·468 085 1
8	50	33	1·698 970 0	9·531 478 9	·340 000 0	·660 000 0
9	17	17	1·230 448 9	$-\infty$	·000 000 0	1·000 000 0
100	0		$-\infty$			

TABLES.

ONE LIFE.

I.

H^M.

HEALTHY MALE LIVES.

H^M.

Elementary Values.

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
10	100 000	5·000 000	$\bar{1}$·997 867	000 397	$\bar{5}$·000 000	10
1	99 510	4·997 867	·998 264	000 292	·002 133	1
2	99 113	·996 131	·998 556	000 176	·003 869	2
3	98 784	·994 687	·998 732	000 067	·005 313	3
4	98 496	·993 419	·998 799	999 952	·006 581	4
15	98 224	·992 218	·998 751	999 837	·007 782	15
6	97 942	·990 969	·998 588	999 722	·009 031	6
7	97 624	·989 557	·998 310	999 604	·010 443	7
8	97 245	·987 867	·997 914	999 584	·012 133	8
9	96 779	·985 781	·997 498	999 744	·014 219	9
20	96 223	·983 279	·997 242	999 828	·016 721	20
1	95 614	·980 521	·997 070	999 947	·019 479	1
2	94 971	·977 591	·997 017	000 036	·022 409	2
3	94 321	·974 608	·997 053	000 054	·025 392	3
4	93 683	·971 661	·997 107	000 004	·028 339	4
25	93 061	·968 768	·997 111	999 976	·031 232	25
6	92 444	·965 879	·997 087	999 904	·034 121	6
7	91 826	·962 966	·996 991	999 883	·037 034	7
8	91 192	·959 957	·996 874	999 886	·040 043	8
9	90 538	·956 831	·996 760	999 873	·043 169	9
30	89 865	·953 591	·996 633	999 914	·046 409	30
1	89 171	·950 224	·996 547	999 919	·049 776	1
2	88 465	·946 771	·996 466	999 921	·053 229	2
3	87 748	·943 237	·996 387	999 904	·056 763	3
4	87 021	·939 624	·996 291	999 882	·060 376	4
35	86 281	·935 915	·996 173	999 853	·064 085	35
6	85 524	·932 088	·996 026	999 844	·067 912	6
7	84 745	·928 114	·995 870	999 862	·071 886	7
8	83 943	·923 984	·995 732	999 867	·076 016	8
9	83 122	·919 716	·995 599	999 902	·080 284	9
40	82 284	·915 315	·995 501	999 921	·084 685	40
1	81 436	·910 816	·995 422	999 891	·089 184	1
2	80 582	·906 238	·995 313	999 828	·093 762	2
3	79 717	·901 551	·995 141	999 810	·098 449	3
4	78 830	·896 692	·994 951	999 722	·103 308	4
45	77 919	·891 643	·994 673	999 670	·108 357	45
6	76 969	·886 316	·994 343	999 665	·113 684	6
7	75 973	·880 659	·994 008	999 675	·119 341	7
8	74 932	·874 667	·993 683	999 657	·125 333	8
9	73 850	·868 350	·993 340	999 677	·131 650	9
50	72 726	·861 690	·993 017	999 682	·138 310	50
1	71 566	·854 707	·992 699	999 612	·145 293	1
2	70 373	·847 406	·992 311	999 535	·152 594	2
3	69 138	·839 717	·991 846	999 498	·160 283	3
4	67 852	·831 563	·991 344	999 423	·168 437	4

Hm.

Elementary Values.

x	Colog p_x	Δ	d_x	Log d_x	Δ	$-\Delta$	x
10	0·002 133	999 603	490	2·690 196	908 595	091 405	10
1	·001 736	999 708	397	·598 791	918 405	081 595	1
2	·001 444	999 824	329	·517 196	942 196	057 804	2
3	·001 268	999 933	288	·459 392	975 177	024 823	3
4	·001 201	000 048	272	·434 569	015 680	984 320	4
15	·001 249	000 163	282	·450 249	052 178	947 822	15
6	·001 412	000 278	318	·502 427	076 212	923 788	6
7	·001 690	000 396	379	·578 639	089 747	910 253	7
8	·002 086	000 416	466	·668 386	076 689	923 311	8
9	·002 502	000 256	556	·745 075	039 542	960 458	9
20	·002 758	000 172	609	·784 617	023 594	976 406	20
1	·002 930	000 053	643	·808 211	004 702	995 298	1
2	·002 983	999 964	650	·812 913	991 908	008 092	2
3	·002 947	999 946	638	·804 821	988 969	011 031	3
4	·002 893	999 996	622	·793 790	996 495	003 505	4
25	·002 889	000 024	617	·790 285	000 703	999 297	25
6	·002 913	000 096	618	·790 988	011 101	988 899	6
7	·003 009	000 117	634	·802 089	013 489	986 511	7
8	·003 126	000 114	654	·815 578	012 437	987 563	8
9	·003 240	000 127	673	·828 015	013 344	986 656	9
30	·003 367	000 086	694	·841 359	007 446	992 554	30
1	·003 453	000 081	706	·848 805	006 714	993 286	1
2	·003 534	000 079	717	·855 519	006 015	993 985	2
3	·003 613	000 096	727	·861 534	007 698	992 302	3
4	·003 709	000 118	740	·869 232	009 864	990 136	4
35	·003 827	000 147	757	·879 096	012 441	987 559	35
6	·003 974	000 156	779	·891 537	012 637	987 363	6
7	·004 130	000 138	802	·904 174	010 169	989 831	7
8	·004 268	000 133	821	·914 343	008 901	991 099	8
9	·004 401	000 098	838	·923 244	005 152	994 848	9
40	·004 499	000 079	848	·928 396	003 062	996 938	40
1	·004 578	000 109	854	·931 458	005 558	994 442	1
2	·004 687	000 172	865	·937 016	010 908	989 092	2
3	·004 859	000 190	887	·947 924	011 594	988 406	3
4	·005 049	000 278	911	·959 518	018 206	981 794	4
45	·005 327	000 330	950	·977 724	020 535	979 465	45
6	·005 657	000 335	996	·998 259	019 192	980 808	6
7	·005 992	000 325	1 041	3·017 451	016 776	983 224	7
8	·006 317	000 343	1 082	·034 227	016 539	983 461	8
9	·006 660	000 323	1 124	·050 766	013 692	986 308	9
50	·006 983	000 318	1 160	·064 458	012 182	987 818	50
1	·007 301	000 388	1 193	·076 640	015 027	984 973	1
2	·007 689	000 465	1 235	·091 667	017 574	982 426	2
3	·008 154	000 502	1 286	·109 241	017 540	982 460	3
4	·008 656	000 577	1 339	·126 781	019 037	980 963	4

HM.

Elementary Values—(continued.)

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
55	66 513	4·822 907	1·990 767	999 371	5·177 093	55
6	65 114	·813 674	·990 138	999 316	·186 326	6
7	63 652	·803 812	·989 454	999 272	·196 188	7
8	62 125	·793 266	·988 726	999 147	·206 734	8
9	60 533	·781 992	·987 873	999 043	·218 008	9
60	58 866	·769 865	·986 916	998 942	·230 135	60
1	57 119	·756 781	·985 858	998 833	·243 219	1
2	55 289	·742 639	·984 691	998 714	·257 361	2
3	53 374	·727 330	·983 405	998 680	·272 670	3
4	51 373	·710 735	·982 085	998 632	·289 265	4
65	49 297	·692 820	·980 717	998 572	·307 180	65
6	47 156	·673 537	·979 289	998 486	·326 463	6
7	44 960	·652 826	·977 775	998 467	·347 174	7
8	42 717	·630 601	·976 242	998 113	·369 399	8
9	40 443	·606 843	·974 355	997 759	·393 157	9
70	38 124	·581 198	·972 114	997 279	·418 802	70
1	35 753	·553 312	·969 393	996 777	·446 688	1
2	33 320	·522 705	·966 170	996 265	·477 295	2
3	30 823	·488 875	·962 435	996 036	·511 125	3
4	28 269	·451 310	·958 471	996 562	·548 690	4
75	25 691	·409 781	·955 033	996 123	·590 219	75
6	23 164	·364 814	·951 156	995 942	·635 186	6
7	20 700	·315 970	·947 098	995 796	·684 030	7
8	18 326	·263 068	·942 894	995 095	·736 932	8
9	16 068	·205 962	·937 989	994 154	·794 038	9
80	13 930	·143 951	·932 143	993 151	·856 049	80
1	11 915	·076 094	·925 294	993 076	·923 906	1
2	10 032	·001 388	·918 370	992 332	·998 612	2
3	8 313	3·919 758	·910 702	992 998	$\bar{4}$·080 242	3
4	6 768	·830 460	·903 700	993 989	·169 540	4
85	5 422	·734 160	·897 689	994 598	·265 840	85
6	4 284	·631 849	·892 287	993 510	·368 151	6
7	3 343	·524 136	·885 797	995 417	·475 864	7
8	2 570	·409 933	·881 214	991 992	·590 067	8
9	1 955	·291 147	·873 206	984 457	·708 853	9
90	1 460	·164 353	·857 663	979 459	·835 647	90
1	1 052	·022 016	·837 122	974 913	·977 984	1
2	723	2·859 138	·812 035	954 543	$\bar{3}$·140 862	2
3	469	·671 173	·766 578	926 005	·328 827	3
4	274	·437 751	·692 583	867 279	·562 249	4
95	135	·130 334	·559 862	704 185	·869 666	95
6	49	1·690 196	·264 047		$\bar{2}$·309 804	6
7	9	0·954 243			$\bar{1}$·045 757	7

H^M.

Elementary Values—(continued.)

x	Colog p_x	Δ	d_x	Log d_x	Δ	$-\Delta$	x
55	0·009 233	000 629	1 399	3·145 818	019 129	980 871	55
6	·009 862	000 684	1 462	·164 947	018 892	981 108	6
7	·010 546	000 728	1 527	·183 839	018 104	981 896	7
8	·011 274	000 853	1 592	·201 943	019 993	980 007	8
9	·012 127	000 957	1 667	·221 936	020 357	979 643	9
60	·013 084	001 058	1 747	·242 293	020 158	979 842	60
1	·014 142	001 167	1 830	·262 451	019 718	980 282	1
2	·015 309	001 286	1 915	·282 169	019 078	980 922	2
3	·016 595	001 320	2 001	·301 247	015 980	984 020	3
4	·017 915	001 368	2 076	·317 227	013 390	986 610	4
65	·019 283	001 428	2 141	·330 617	011 015	988 985	65
6	·020 711	001 514	2 196	·341 632	009 197	990 803	6
7	·022 225	001 533	2 243	·350 829	005 961	994 039	7
8	·023 758	001 887	2 274	·356 790	008 511	991 489	8
9	·025 645	002 241	2 319	·365 301	009 631	990 369	9
70	·027 886	002 721	2 371	·374 932	011 210	988 790	70
1	·030 607	003 223	2 433	·386 142	011 277	988 723	1
2	·033 830	003 735	2 497	·397 419	009 802	990 198	2
3	·037 565	003 964	2 554	·407 221	004 062	995 938	3
4	·041 529	003 438	2 578	·411 283	991 322	008 678	4
75	·044 967	003 877	2 527	·402 605	989 036	010 964	75
6	·048 844	004 058	2 464	·391 641	983 840	016 160	6
7	·052 902	004 204	2 374	·375 481	978 243	021 757	7
8	·057 106	004 905	2 258	·353 724	976 284	023 716	8
9	·062 011	005 846	2 138	·330 008	974 267	025 733	9
80	·067 857	006 849	2 015	·304 275	970 575	029 425	80
1	·074 706	006 924	1 883	·274 850	960 426	039 574	1
2	·081 630	007 668	1 719	·235 276	953 652	046 348	2
3	·089 298	007 002	1 545	·188 928	940 117	059 883	3
4	·096 300	006 011	1 346	·129 045	927 097	072 903	4
85	·102 311	005 402	1 138	·056 142	917 448	082 552	85
6	·107 713	006 490	941	2·973 590	914 589	085 411	6
7	·114 203	004 583	773	·888 179	900 696	099 304	7
8	·118 786	008 008	615	·788 875	905 730	094 270	8
9	·126 794	015 543	495	·694 605	916 055	083 945	9
90	·142 337	020 541	408	·610 660	906 536	093 464	90
1	·162 878	025 087	329	·517 196	887 638	112 362	1
2	·187 965	045 457	254	·404 834	885 201	114 799	2
3	·233 422	073 995	195	·290 035	852 980	147 020	3
4	·307 417	132 721	139	·143 015	791 483	208 517	4
95	·440 138	295 815	86	1·934 498	667 562	332 438	95
6	·735 953		40	·602 060	352 183	647 817	6
7			9	0·954 243			7

H^M.

Probabilities of Living over, and of Dying in, a Year, and the Average Duration of Life, at each Age.

x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$	x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$
10	·995 100	·004 900	50·291	55	·978 967	·021 033	16·962
1	·996 010	·003 990	49·536	6	·977 547	·022 453	16·316
2	·996 681	·003 319	48·733	7	·976 010	·023 990	15·679
3	·997 085	·002 915	47·893	8	·974 374	·025 626	15·052
4	·997 238	·002 762	47·032	9	·972 461	·027 539	14·435
15	·997 129	·002 871	46·161	60	·970 322	·029 678	13·830
6	·996 753	·003 247	45·292	1	·967 962	·032 038	13·237
7	·996 118	·003 882	44·438	2	·965 364	·034 636	12·659
8	·995 208	·004 792	43·609	3	·962 510	·037 490	12·095
9	·994 255	·005 745	42·817	4	·959 590	·040 410	11·547
20	·993 671	·006 329	42·061	65	·956 569	·043 431	11·012
1	·993 275	·006 725	41·326	6	·953 431	·046 569	10·489
2	·993 156	·006 844	40·603	7	·950 111	·049 889	9·977
3	·993 236	·006 764	39·879	8	·946 766	·053 234	9·475
4	·993 361	·006 639	39·147	9	·942 660	·057 340	8·980
25	·993 370	·006 630	38·405	70	·937 808	·062 192	8·495
6	·993 315	·006 685	37·658	1	·931 950	·068 050	8·026
7	·993 096	·006 904	36·908	2	·925 060	·074 940	7·575
8	·992 828	·007 172	36·162	3	·917 140	·082 860	7·148
9	·992 567	·007 433	35·419	4	·908 805	·091 195	6·749
30	·992 277	·007 723	34·681	75	·901 639	·098 361	6·376
1	·992 083	·007 917	33·946	6	·893 628	·106 372	6·017
2	·991 895	·008 105	33·213	7	·885 314	·114 686	5·674
3	·991 715	·008 285	32·481	8	·876 787	·123 213	5·344
4	·991 496	·008 504	31·748	9	·866 941	·133 059	5·025
35	·991 226	·008 774	31·016	80	·855 348	·144 652	4·719
6	·990 891	·009 109	30·286	1	·841 964	·158 036	4·433
7	·990 536	·009 464	29·560	2	·828 648	·171 352	4·171
8	·990 220	·009 780	28·838	3	·814 147	·185 853	3·930
9	·989 918	·010 082	28·118	4	·801 123	·198 877	3·713
40	·989 694	·010 306	27·399	85	·790 115	·209 885	3·511
1	·989 513	·010 487	26·679	6	·780 345	·219 655	3·310
2	·989 266	·010 734	25·956	7	·768 770	·231 230	3·101
3	·988 873	·011 127	25·233	8	·760 700	·239 300	2·884
4	·988 444	·011 556	24·511	9	·746 804	·253 196	2·634
45	·987 808	·012 192	23·792	90	·720 548	·279 452	2·357
6	·987 060	·012 940	23·079	1	·687 263	·312 737	2·077
7	·986 298	·013 702	22·375	2	·648 686	·351 314	1·795
8	·985 560	·014 440	21·679	3	·584 222	·415 778	1·496
9	·984 780	·015 220	20·989	4	·492 700	·507 300	1·204
50	·984 050	·015 950	20·306	95	·362 964	·637 036	·930
1	·983 330	·016 670	19·627	6	·183 673	·816 327	·684
2	·982 451	·017 549	18·951	7	·000 000	1·000 000	·500
3	·981 400	·018 600	18·281				
4	·980 266	·019 734	17·618				

H[M].

THREE PER-CENT.

Hm.
3 PER-CENT.
Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	74 409·4	1 796 867	36 413 646	19 906·2	756 181·7	10
1	71 888·1	1 724 979	34 616 779	19 552·2	736 275·5	1
2	69 515·9	1 655 463	32 891 800	19 273·8	716 723·3	2
3	67 267·1	1 588 196	31 236 337	19 049·7	697 449·6	3
4	65 117·5	1 523 079	29 648 141	18 859·3	678 399·8	4
15	63 046·2	1 460 032	28 125 062	18 684·7	659 540·5	15
6	61 034·2	1 398 998	26 665 030	18 509.0	640 855·8	6
7	59 064·1	1 339 934	25 266 032	18 316·6	622 346·7	7
8	57 121·2	1 282 813	23 926 098	18 094·0	604 030·1	8
9	55 191·7	1 227 621	22 643 285	17 828·2	585 936·1	9
20	53 276·3	1 174 345	21 415 664	17 520·4	568 107·9	20
1	51 397·2	1 122 947	20 241 319	17 193·0	550 587·5	1
2	49 564·7	1 073 383	19 118 371	16 857·4	533 394·5	2
3	47 791·7	1 025 591	18 044 988	16 528·1	516 537·0	3
4	46 085·8	979 505·3	17 019 397	16 214·2	500 008·9	4
25	44 446·5	935 058·8	16 039 892	15 917·2	483 794·7	25
6	42 865·8	892 193·0	15 104 833	15 631·1	467 877·5	6
7	41 339·1	850 854·0	14 212 640	15 352·9	452 246·5	7
8	39 857·9	810 996·1	13 361 786	15 075·8	436 893·6	8
9	38 419·5	772 576·6	12 550 790	14 798·2	421 817·9	9
30	37 023·2	735 553·4	11 778 214	14 521·0	407 019·6	30
1	35 667·3	699 886·1	11 042 660	14 243·4	392 498·7	1
2	34 354·2	665 531·9	10 342 774	13 969·2	378 255·3	2
3	33 083·3	632 448·6	9 677 242	13 698·9	364 286·1	3
4	31 853·6	600 595·0	9 044 794	13 432·8	350 587·2	4
35	30 662·8	569 932·2	8 444 199	13 169·8	337 154·5	35
6	29 508·6	540 423·6	7 874 266	12 908·6	323 984·7	6
7	28 388·1	512 035·5	7 333 843	12 647·6	311 076·1	7
8	27 300·5	484 735·0	6 821 807	12 386·8	298 428·4	8
9	26 246·1	458 489·0	6 337 072	12 127·6	286 041·6	9
40	25 224·7	433 264·2	5 878 583	11 870·7	273 914·1	40
1	24 237·6	409 026·6	5 445 319	11 618·3	262 043·4	1
2	23 284·9	385 741·7	5 036 292	11 371·5	250 425·1	2
3	22 364·0	363 377·6	4 650 551	11 128·8	239 053·6	3
4	21 471·1	341 906·6	4 287 173	10 887·3	227 924·7	4
45	20 604·8	321 301·8	3 945 267	10 646·3	217 037·5	45
6	19 760·8	301 541·0	3 623 965	10 402·4	206 391·1	6
7	18 936·9	282 604·1	3 322 424	10 154·2	195 988·7	7
8	18 133·5	264 470·7	3 039 820	9 902·27	185 834·5	8
9	17 351·1	247 119·6	2 775 349	9 648·05	175 932·2	9
50	16 589·3	230 530·3	2 528 229	9 391·66	166 284·2	50
1	15 849·2	214 681·0	2 297 699	9 134·76	156 892·5	1
2	15 131·1	199 549·9	2 083 018	8 878·25	147 757·8	2
3	14 432·6	185 117·3	1 883 468	8 620·44	138 879·5	3
4	13 751·6	171 365·8	1 698 351	8 359·81	130 259·1	4

Hm.

3 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	13 087·6	158 278·2	1 526 985	8 096·34	121 899·2	55
6	12 439·1	145 839·1	1 368 707	7 829·08	113 802·9	6
7	11 805·7	134 033·4	1 222 868	7 557·92	105 973·8	7
8	11 186·8	122 846·6	1 088 834	7 282·95	98 415·91	8
9	10 582·7	112 263·9	965 987·7	7 004·63	91 132·95	9
60	9 991·51	102 272·4	853 723·8	6 721·69	84 128·32	60
1	9 412·61	92 859·77	751 451·4	6 433·80	77 406·64	1
2	8 845·67	84 014·10	658 591·6	6 141·02	70 972·84	2
3	8 290·57	75 723·52	574 577·5	5 843·56	64 831·82	3
4	7 747·34	67 976·19	498 854·0	5 541·80	58 988·26	4
65	7 217·74	60 758·45	430 877·8	5 237·85	53 446·26	65
6	6 703·17	54 055·28	370 119·4	4 933·50	48 208·62	6
7	6 204·86	47 850·42	316 064·1	4 630·44	43 275·11	7
8	5 723·60	42 126·82	268 213·7	4 329·90	38 644·67	8
9	5 261·08	36 865·74	226 086·9	4 034·08	34 314·77	9
70	4 814·96	32 050·78	189 221·1	3 741·20	30 280·69	70
1	4 383·99	27 666·79	157 170·3	3 450·47	26 539·49	1
2	3 966·66	23 700·13	129 503·5	3 160·83	23 089·01	2
3	3 562·52	20 137·61	105 803·4	2 872·23	19 928·18	3
4	3 172·17	16 965·44	85 665·80	2 585·63	17 055·96	4
75	2 798·91	14 166·53	68 700·36	2 304·77	14 470·32	75
6	2 450·10	11 716·43	54 533·83	2 037·49	12 165·55	6
7	2 125·71	9 590·717	42 817·40	1 784·46	10 128·06	7
8	1 827·11	7 763·609	33 226·68	1 547·77	8 343·609	8
9	1 555·32	6 208·285	25 463·07	1 329·20	6 795·842	9
80	1 309·10	4 899·184	19 254·79	1 128·28	5 466·642	80
1	1 087·12	3 812·061	14 355·61	944·429	4 338·365	1
2	888·659	2 923·402	10 543·54	777·628	3 393·937	2
3	714·938	2 208·464	7 620·14	629·790	2 616·309	3
4	565·111	1 643·354	5 411·68	500·787	1 986·518	4
85	439·537	1 203·817	3 768·32	391·672	1 485·732	85
6	337·170	866·647	2 564·51	302·107	1 094·060	6
7	255·445	611·202	1 697·86	230·203	791·953	7
8	190·659	420·543	1 086·66	172·857	561·750	8
9	140·810	279·733	666·11	128·561	388·893	9
90	102·095	177·638	386·38	93·947 0	260·331	90
1	71·421 4	106·217	208·74	66·247 5	166·384	1
2	47·655 6	58·561	102·53	44·561 9	100·137	2
3	30·013 1	28·548	43·97	28·307 4	55·575	3
4	17·023 6	11·525	15·42	16·192 1	27·268	4
95	8·143 2	3·381	3·89	7·807 6	11·076	95
6	2·869 6	·512	·51	2·771 1	3·268	6
7	·511 7	·000	·00	·496 8	·497	7

Hᴹ.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·871 628	1·985 029	$\bar{5}$·128 372	0·014 971	6·254 516	982 268	10
1	·856 657	·985 427	·143 343	·014 573	·236 784	982 136	1
2	·842 084	·985 719	·157 916	·014 281	·218 920	981 984	2
3	·827 803	·985 895	·172 197	·014 105	·200 904	981 818	3
4	·813 698	·985 961	·186 302	·014 039	·182 722	981 641	4
15	·799 659	·985 914	·200 341	·014 086	·164 363	981 454	15
6	·785 573	·985 751	·214 427	·014 249	·145 817	981 266	6
7	·771 324	·985 473	·228 676	·014 527	·127 083	981 080	7
8	·756 797	·985 077	·243 203	·014 923	·108 163	980 901	8
9	·741 874	·984 660	·258 126	·015 340	·089 064	980 732	9
20	·726 534	·984 406	·273 466	·015 594	·069 796	980 564	20
1	·710 940	·984 232	·289 060	·015 768	·050 360	980 395	1
2	·695 172	·984 180	·304 828	·015 820	·030 755	980 219	2
3	·679 352	·984 215	·320 648	·015 785	·010 974	980 033	3
4	·663 567	·984 270	·336 433	·015 730	5·991 007	979 832	4
25	·647 837	·984 274	·352 163	·015 726	·970 839	979 620	25
6	·632 111	·984 250	·367 889	·015 750	·950 459	979 396	6
7	·616 361	·984 153	·383 639	·015 847	·929 855	979 164	7
8	·600 514	·984 037	·399 486	·015 963	·909 019	978 923	8
9	·584 551	·983 923	·415 449	·016 077	·887 942	978 672	9
30	·568 474	·983 796	·431 526	·016 204	·866 614	978 413	30
1	·552 270	·983 710	·447 730	·016 290	·845 027	978 142	1
2	·535 980	·983 629	·464 020	·016 371	·823 169	977 856	2
3	·519 609	·983 550	·480 391	·016 450	·801 025	977 557	3
4	·503 159	·983 453	·496 841	·016 547	·778 582	977 241	4
35	·486 612	·983 336	·513 388	·016 664	·755 823	976 911	35
6	·469 948	·983 189	·530 052	·016 811	·732 734	976 566	6
7	·453 137	·983 033	·546 863	·016 967	·709 300	976 204	7
8	·436 170	·982 894	·563 830	·017 106	·685 504	975 825	8
9	·419 064	·982 762	·580 936	·017 238	·661 329	975 424	9
40	·401 826	·982 664	·598 174	·017 336	·636 753	974 999	40
1	·384 490	·982 585	·615 510	·017 415	·611 752	974 545	1
2	·367 075	·982 475	·632 925	·017 525	·586 297	974 061	2
3	·349 550	·982 304	·650 450	·017 696	·560 358	973 549	3
4	·331 854	·982 114	·668 146	·017 886	·533 907	973 006	4
45	·313 968	·981 836	·686 032	·018 164	·506 913	972 433	45
6	·295 804	·981 506	·704 196	·018 494	·479 346	971 833	6
7	·277 310	·981 171	·722 690	·018 829	·451 179	971 199	7
8	·258 481	·980 846	·741 519	·019 154	·422 378	970 529	8
9	·239 327	·980 502	·760 673	·019 498	·392 907	969 821	9
50	·219 829	·980 179	·780 171	·019 821	·362 728	969 066	50
1	·200 008	·979 862	·799 992	·020 138	·331 794	968 258	1
2	·179 870	·979 474	·820 130	·020 526	·300 052	967 395	2
3	·159 344	·979 009	·840 656	·020 991	·267 447	966 477	3
4	·138 353	·978 506	·861 647	·021 494	·233 924	965 497	4

Hm.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·745 484	017 732	4·298 988	992 208	$\bar{5}$·701 012	007 792	10
1	·763 216	017 864	·291 196	993 771	·708 804	006 229	1
2	·781 080	018 016	·284 967	994 922	·715 033	005 078	2
3	·799 096	018 182	·279 889	995 637	·720 111	004 363	3
4	·817 278	018 359	·275 526	995 961	·724 474	004 039	4
15	·835 637	018 546	·271 487	995 896	·728 513	004 104	15
6	·854 183	018 734	·267 383	995 462	·732 617	004 538	6
7	·872 917	018 920	·262 845	994 689	·737 155	005 311	7
8	·891 837	019 099	·257 534	993 574	·742 466	006 426	8
9	·910 936	019 268	·251 108	992 436	·748 892	007 564	9
20	·930 204	019 436	·243 544	991 808	·756 456	008 192	20
1	·949 640	019 605	·235 352	991 440	·764 648	008 560	1
2	·969 245	019 781	226 792	991 431	·773 208	008 569	2
3	·989 026	019 967	·218 223	991 674	·781 777	008 326	3
4	6·008 993	020 168	·209 897	991 969	·790 103	008 031	4
25	·029 161	020 380	·201 866	992 123	·798 134	007 877	25
6	·049 541	020 604	·193 989	992 200	·806 011	007 800	6
7	·070 145	020 836	·186 189	992 090	·813 811	007 910	7
8	·090 981	021 077	·178 279	991 931	·821 721	008 069	8
9	·112 058	021 328	·170 210	991 785	·829 790	008 215	9
30	·133 386	021 587	·161 995	991 618	·838 005	008 382	30
1	·154 973	021 858	·153 613	991 559	·846 387	008 441	1
2	·176 831	022 144	·145 172	991 513	·854 828	008 487	2
3	·198 975	022 443	·136 685	991 480	·863 315	008 520	3
4	·221 418	022 759	·128 165	991 413	·871 835	008 587	4
35	·244 177	023 089	·119 578	991 301	·880 422	008 699	35
6	·267 266	023 434	·110 879	991 130	·889 121	008 870	6
7	·290 700	023 796	·102 009	990 950	·897 991	009 050	7
8	·314 496	024 175	·092 959	990 815	·907 041	009 185	8
9	·338 671	024 576	·083 774	990 702	·916 226	009 298	9
40	·363 247	025 001	·074 476	990 666	·925 524	009 334	40
1	·388 248	025 455	·065 142	990 676	·934 858	009 324	1
2	·413 703	025 939	·055 818	990 632	·944 182	009 368	2
3	·439 642	026 451	·046 450	990 468	·953 550	009 532	3
4	·466 093	026 994	·036 918	990 283	·963 082	009 717	4
45	·493 087	027 567	·027 201	989 935	·972 799	010 065	45
6	·520 654	028 167	·017 136	989 509	·982 864	010 491	6
7	·548 821	028 801	·006 645	989 090	·993 355	010 910	7
8	·577 622	029 471	3·995 735	988 705	$\bar{4}$·004 265	011 295	8
9	·607 093	030 179	·984 440	988 302	·015 560	011 698	9
50	·637 272	030 934	·972 742	987 955	·027 258	012 045	50
1	·668 206	031 742	·960 697	987 630	·039 303	012 370	1
2	·699 948	032 605	·948 327	987 203	·051 673	012 797	2
3	·732 553	033 523	·935 530	986 666	·064 470	013 334	3
4	·766 076	034 503	·922 196	986 093	·077 804	013 907	4

H^M.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	4·116 859	1·977 931	5·883 141	0·022 069	5·199 421	964 453	55
6	·094 790	·977 300	·905 210	·022 700	·163 874	963 339	6
7	·072 090	·976 617	·927 910	·023 383	·127 213	962 150	7
8	·048 707	·975 889	·951 293	·024 111	·089 363	960 877	8
9	·024 596	·975 035	·975 404	·024 965	·050 240	959 518	9
60	3·999 631	·974 079	4·000 369	·025 921	·009 758	958 070	60
1	·973 710	·973 021	·026 290	·026 979	4·967 828	956 524	1
2	·946 731	·971 854	·053 269	·028 146	·924 352	954 879	2
3	·918 585	·970 568	·081 415	·029 432	·879 231	953 126	3
4	·889 153	·969 248	·110 847	·030 752	·832 357	951 250	4
65	·858 401	·967 879	·141 599	·032 121	·783 607	949 231	65
6	·826 280	·966 452	·173 720	·033 548	·732 838	947 048	6
7	·792 732	·964 937	·207 268	·035 063	·679 886	944 673	7
8	·757 669	·963 406	·242 331	·036 594	·624 559	942 064	8
9	·721 075	·961 518	·278 925	·038 482	·566 623	939 216	9
70	·682 593	·959 277	·317 407	·040 723	·505 839	936 120	70
1	·641 870	·956 555	·358 130	·043 445	·441 959	932 792	1
2	·598 425	·953 333	·401 575	·046 667	·374 751	929 257	2
3	·551 758	·949 598	·448 242	·050 402	·304 008	925 557	3
4	·501 356	·945 633	·498 644	·054 367	·229 565	921 699	4
75	·446 989	·942 196	·553 011	·057 804	·151 264	917 531	75
6	·389 185	·938 319	·610 815	·061 681	·068 795	913 056	6
7	·327 504	·934 260	·672 496	·065 740	3·981 851	908 213	7
8	·261 764	·930 057	·738 236	·069 943	·890 064	902 908	8
9	·191 821	·925 152	·808 179	·074 848	·792 972	897 152	9
80	·116 973	·919 306	·883 027	·080 694	·690 124	891 036	80
1	·036 279	·912 456	·963 721	·087 544	·581 160	884 729	1
2	2·948 735	·905 533	$\bar{3}$·051 265	·094 467	·465 889	878 201	2
3	·854 268	·897 866	·145 732	·102 134	·344 090	871 641	3
4	·752 134	·890 861	·247 866	·109 139	·215 731	864 829	4
85	·642 995	·884 853	·357 005	·115 147	·080 560	857 282	85
6	·527 848	·879 450	·472 152	·120 550	2·937 842	848 343	6
7	·407 298	·872 959	·592 702	·127 041	·786 185	837 625	7
8	·280 257	·868 377	·719 743	·131 623	·623 810	822 933	8
9	·148 634	·860 369	·851 366	·139 631	·446 743	802 793	9
90	·009 003	·844 825	·990 997	·155 175	·249 536	776 657	90
1	1·853 828	·824 286	$\bar{2}$·146 172	·175 714	·026 193	741 417	1
2	·678 114	·799 197	·321 886	·200 803	1·767 610	687 967	2
3	·477 311	·753 741	·522 689	·246 259	·455 577	606 045	3
4	·231 052	·679 746	·768 948	·320 254	·061 622	467 462	4
95	0·910 798	·547 025	$\bar{1}$·089 202	·452 975	0·529 084	179 948	95
6	·457 823	·251 209	·542 177	·748 791	1·709 032		6
7	$\bar{1}$·709 032		0·290 968				7

Hm.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{6}$·800 579	035 547	3·908 289	985 422	$\bar{4}$·091 711	014 578	55
6	·836 126	036 661	·893 711	984 691	·106 289	015 309	6
7	·872 787	037 850	·878 402	983 906	·121 598	016 094	7
8	·910 637	039 123	·862 308	983 077	·137 692	016 923	8
9	·949 760	040 482	·845 385	982 093	·154 615	017 907	9
60	·990 242	041 930	·827 478	980 990	·172 522	019 010	60
1	$\bar{5}$·032 172	043 476	·808 468	979 772	·191 532	020 228	1
2	·075 648	045 121	·788 240	978 438	·211 760	021 562	2
3	·120 769	046 874	·766 678	976 973	·233 322	023 027	3
4	·167 643	048 750	·743 651	975 502	·256 349	024 498	4
65	·216 393	050 769	·719 153	974 003	·280 847	025 997	65
6	·267 162	052 952	·693 156	972 466	·306 844	027 534	6
7	·320 114	055 327	·665 622	970 856	·334 378	029 144	7
8	·375 441	057 936	·636 478	969 267	·363 522	030 733	8
9	·433 377	060 784	·605 745	967 266	·394 255	032 734	9
70	·494 161	063 880	·573 011	964 868	·426 989	035 132	70
1	·558 041	067 208	·537 879	961 922	·462 121	038 078	1
2	·625 249	070 743	·499 801	958 418	·500 199	041 582	2
3	·695 992	074 443	·458 219	954 348	·541 781	045 652	3
4	·770 435	078 301	·412 567	950 061	·587 433	049 939	4
75	·848 736	082 469	·362 628	946 467	·637 372	053 533	75
6	·931 205	086 944	·309 095	942 411	·690 905	057 589	6
7	$\bar{4}$·018 149	091 787	·251 506	938 199	·748 494	061 801	7
8	·109 936	097 092	·189 705	933 885	·810 295	066 115	8
9	·207 028	102 848	·123 590	928 826	·876 410	071 174	9
80	·309 876	108 964	·052 416	922 753	·947 584	077 247	80
1	·418 840	115 271	2·975 169	915 603	$\bar{3}$·024 831	084 397	1
2	·534 111	121 799	·890 772	908 424	·109 228	091 576	2
3	·655 910	128 359	·799 196	900 457	·200 804	099 543	3
4	·784 269	135 171	·699 653	893 270	·300 347	106 730	4
85	·919 440	142 718	·592 923	887 237	·407 077	112 763	85
6	$\bar{3}$·062 158	151 657	·480 160	881 951	·519 840	118 049	6
7	·213 815	162 375	·362 111	875 576	·637 889	124 424	7
8	·376 190	177 067	·237 687	871 423	·762 313	128 577	8
9	·553 257	197 207	·109 110	863 773	·890 890	136 227	9
90	·750 464	223 343	1·972 883	848 286	$\bar{2}$·027 117	151 714	90
1	·973 807	258 583	·821 169	827 794	·178 831	172 206	1
2	$\bar{2}$·232 390	312 033	·648 963	802 938	·351 037	197 062	2
3	·544 423	393 955	·451 901	757 403	·548 099	242 597	3
4	·938 378	532 538	·209 304	683 213	·790 696	316 787	4
95	$\bar{1}$·470 916	820 052	0·892 517	550 138	$\bar{1}$·107 483	449 862	95
6	0·290 968		·442 655	253 540	·557 345	746 460	6
7			$\bar{1}$·696 195		0·303 805		7

H^M.

3 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	24·148 4	·267 523	·010 638	55	12·093 8	·618 628	·047 246
1	23·995 3	·271 981	·010 881	6	11·724 2	·629 392	·049 464
2	23·814 2	·277 257	·011 173	7	11·353 3	·640 195	·051 824
3	23·610 3	·283 195	·011 507	8	10·981 3	·651 029	·054 337
4	23·389 7	·289 620	·011 875	9	10·608 3	·661 895	·057 019
15	23·158 1	·296 366	·012 268	60	10·235 9	·672 740	·059 874
6	22·921 5	·303 256	·012 677	1	9·865 5	·683 530	·062 908
7	22·686 1	·310 114	·013 093	2	9·497 8	·694 240	·066 132
8	22·457 7	·316 765	·013 504	3	9·133 7	·704 844	·069 555
9	22·242 9	·323 024	·013 898	4	8·774 1	·715 316	·073 185
20	22·042 5	·328 859	·014 272	65	8·417 9	·725 691	·077 054
1	21·848 4	·334 513	·014 641	6	8·064 1	·735 996	·081 199
2	21·656 2	·340 110	·015 012	7	7·711 8	·746 259	·085 661
3	21·459 6	·345 836	·015 398	8	7·360 2	·756 499	·090 488
4	21·253 9	·351 827	·015 810	9	7·007 3	·766 779	·095 761
25	21·037 9	·358 120	·016 250	70	6·656 5	·776 995	·101 482
6	20·813 6	·364 651	·016 717	1	6·310 9	·787 062	·107 656
7	20·582 3	·371 389	·017 208	2	5·974 8	·796 849	·114 246
8	20·347 2	·378 237	·017 718	3	5·652 6	·806 234	·121 190
9	20·109 0	·385 175	·018 247	4	5·348 2	·815 100	·128 398
30	19·867 4	·392 212	·018 795	75	5·061 4	·823 453	·135 851
1	19·622 7	·399 340	·019 364	6	4·782 0	·831 592	·143 824
2	19·372 6	·406 622	·019 959	7	4·511 8	·839 463	·152 304
3	19·116 9	·414 072	·020 583	8	4·249 1	·847 113	·161 382
4	18·854 9	·421 703	·021 239	9	3·991 6	·854 613	·171 209
35	18·587 1	·429 503	·021 928	80	3·742 4	·861 872	·181 737
6	18·314 1	·437 452	·022 649	1	3·506 6	·868 741	·192 773
7	18·037 0	·445 525	·023 403	2	3·289 7	·875 058	·203 992
8	17·755 6	·453 721	·024 191	3	3·089 0	·880 902	·215 431
9	17·468 9	·462 072	·025 019	4	2·908 0	·886 174	·226 758
40	17·176 2	·470 597	·025 891	85	2·738 8	·891 102	·238 337
1	16·875 7	·479 349	·026 816	6	2·570 4	·896 009	·250 957
2	16·566 2	·488 364	·027 801	7	2·392 7	·901 184	·265 625
3	16·248 3	·497 622	·028 851	8	2·205 7	·906 629	·282 815
4	15·924 1	·507 066	·029 961	9	1·986 6	·913 012	·305 703
45	15·593 5	·516 693	·031 138	90	1·739 9	·920 196	·335 846
6	15·259 6	·526 420	·032 376	1	1·487 2	·927 558	·372 935
7	14·923 4	·536 211	·033 674	2	1·228 8	·935 082	·419 537
8	14·584 7	·546 077	·035 039	3	·951 2	·943 169	·483 382
9	14·242 3	·556 049	·036 481	4	·677 0	·951 157	·567 187
50	13·896 3	·566 127	·038 005	95	·415 2	·958 780	·677 477
1	13·545 2	·576 354	·039 625	6	·178 3	·965 679	·819 543
2	13·188 1	·586 755	·041 356	7	·000 0	·970 874	·970 874
3	12·826 4	·597 291	·043 199				
4	12·461 5	·607 916	·045 160				

H^{M}.

THREE AND A HALF PER-CENT.

H^M.

$3\frac{1}{2}$ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	70 891·9	1 556 354	29 720 786	15 864·2	567 167·5	10
1	68 159·0	1 488 195	28 164 432	15 528·6	551 303·3	1
2	65 591·3	1 422 604	26 676 237	15 265·9	535 774·6	2
3	63 162·9	1 359 441	25 253 633	15 055·5	520 508·7	3
4	60 849·0	1 298 592	23 894 192	14 877·6	505 453·2	4
15	58 629·0	1 239 963	22 595 600	14 715·3	490 575·6	15
6	56 483·7	1 183 479	21 355 638	14 552·6	475 860·3	6
7	54 396·5	1 129 083	20 172 159	14 375·4	461 307·7	7
8	52 352·9	1 076 730	19 043 076	14 171·4	446 932·3	8
9	50 340·2	1 026 389	17 966 346	13 929·0	432 760·9	9
20	48 358·4	978 031·1	16 939 957	13 649·6	418 831·9	20
1	46 427·4	931 603·7	15 961 926	13 353·9	405 182·3	1
2	44 555·7	887 048·0	15 030 322	13 052·2	391 828·5	2
3	42 754·4	844 293·7	14 143 274	12 757·6	378 776·3	3
4	41 029·1	803 264·5	13 298 981	12 478·1	366 018·7	4
25	39 378·5	763 886·0	12 495 716	12 214·9	353 540·5	25
6	37 794·6	726 091·5	11 731 830	11 962·7	341 325·6	6
7	36 272·4	689 819·1	11 005 739	11 718·6	329 362·9	7
8	34 803·8	655 015·2	10 315 919	11 476·6	317 644·3	8
9	33 385·7	621 629·5	9 660 904	11 235·4	306 167·7	9
30	32 017·0	589 612·6	9 039 275	10 995·7	294 932·3	30
1	30 695·4	558 917·2	8 449 662	10 756·8	283 936·6	1
2	29 422·6	529 494·6	7 890 745	10 522·0	273 179·8	2
3	28 197·2	501 297·5	7 361 250	10 291·6	262 657·8	3
4	27 017·9	474 279·5	6 859 953	10 065·9	252 366·3	4
35	25 882·3	448 397·2	6 385 673	9 843·87	242 300·4	35
6	24 787·7	423 609·6	5 937 276	9 624·46	232 456·6	6
7	23 731·3	399 878·3	5 513 667	9 406·32	222 832·1	7
8	22 711·8	377 166·5	5 113 788	9 189·33	213 425·8	8
9	21 729·1	355 437·4	4 736 622	8 974·71	204 236·4	9
40	20 782·7	334 654·7	4 381 185	8 763·05	195 261·7	40
1	19 872·9	314 781·7	4 046 530	8 556·11	186 498·7	1
2	18 999·6	295 782·2	3 731 748	8 354·76	177 942·6	2
3	18 160·0	277 622·2	3 435 966	8 157·71	169 587·8	3
4	17 350·7	260 271·5	3 158 344	7 962·48	161 430·1	4
45	16 570·2	243 701·3	2 898 072	7 768·74	153 467·6	45
6	15 814·7	227 886·7	2 654 371	7 573·55	145 698·9	6
7	15 082·1	212 804·5	2 426 484	7 375·82	138 125·3	7
8	14 372·4	198 432·1	2 213 680	7 176·15	130 749·5	8
9	13 685·9	184 746·2	2 015 248	6 975·64	123 573·3	9
50	13 021·8	171 724·4	1 830 501	6 774·38	116 597·7	50
1	12 380·8	159 343·5	1 658 777	6 573·70	109 823·3	1
2	11 762·7	147 580·8	1 499 434	6 374·29	103 249·6	2
3	11 165·5	136 415·3	1 351 853	6 174·85	96 875·33	3
4	10 587·3	125 828·1	1 215 437	5 974·19	90 700·49	4

Hm.

$3\frac{1}{2}$ PER-CENT.

Commutation Table——(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	10 027·4	115 800·7	1 089 609	5 772·32	84 726·30	55
6	9 484·51	106 316·2	973 808·7	5 568·54	78 953·98	6
7	8 958·02	97 358·14	867 492·6	5 362·79	73 385·44	7
8	8 447·46	88 910·68	770 134·4	5 155·16	68 022·65	8
9	7 952·65	80 958·04	681 223.7	4 946·00	62 867·49	9
60	7 472·11	73 485·93	600 265·7	4 734·40	57 921·49	60
1	7 005.18	66 480·75	526 779·8	4 520·15	53 187·08	1
2	6 551·45	59 929·30	460 299·0	4 303·30	48 666·94	2
3	6 110·66	53 818·65	400 369·7	4 084·06	44 363·63	3
4	5 682·67	48 135·97	346 551·1	3 862·72	40 279·57	4
65	5 268·63	42 867·34	298 415·1	3 640·84	36 416·85	65
6	4 869·38	37 997·96	255 547·8	3 419·76	32 776·01	6
7	4 485·63	33 512·34	217 549·8	3 200·67	29 356·25	7
8	4 117·72	29 394·61	184 037·5	2 984·45	26 155·58	8
9	3 766·69	25 627·93	154 642·9	2 772·66	23 171·13	9
70	3 430·63	22 197·30	129 014·9	2 563·99	20 398·46	70
1	3 108·48	19 088·82	106 817·6	2 357·84	17 834·48	1
2	2 798·98	16 289·84	87 728·81	2 153·46	15 476·63	2
3	2 501·67	13 788·18	71 438·97	1 950·80	13 323·17	3
4	2 216·79	11 571·39	57 650·80	1 750·52	11 372·37	4
75	1 946·50	9 624·883	46 079·41	1 555·20	9 621·842	75
6	1 695·69	7 929·191	36 454·53	1 370·21	8 066·643	6
7	1 464·08	6 465·116	28 525·34	1 195·94	6 696·430	7
8	1 252·34	5 212·781	22 060·22	1 033·71	5 500·491	8
9	1 060·90	4 151·881	16 847·44	884·622	4 466·784	9
80	888·634	3 263·247	12 695·56	748·233	3 582·162	80
1	734·388	2 528·859	9 432·314	624·037	2 833·929	1
2	597·419	1 931·440	6 903·455	511·902	2 209·892	2
3	478·309	1 453·131	4 972·015	412·995	1 697·990	3
4	376·245	1 076·886	3 518·884	327·106	1 284·995	4
85	291·226	785·660 0	2 441·998	254·809	957·889 5	85
6	222·321	563·339 5	1 656·338	195·752	703·080 2	6
7	167·620	395·719 4	1 092·998	148·570	507·327 9	7
8	124·504	271·215 7	697·279	111·122	358·758 0	8
9	91·507 3	179·708 4	426·063	82·335 7	247·636 1	9
90	66·027 0	113·681 4	246·355	59·949 9	165·300 3	90
1	45·966 8	67·714 6	132·673	42·122 5	105·350 5	1
2	30·522 9	37·191 7	64·959	28·233 1	63·228 00	2
3	19·130 2	18·061 5	27·767	17·872 5	34·994 95	3
4	10·798 4	7·263 1	9·706	10·187 6	17·122 41	4
95	5·140 5	2·122 6	2·443	4·894 8	6·934 83	95
6	1·802 7	·319 9	·320	1·730 9	2·040 00	6
7	·319 9	·000 0	·000	·309 1	·309 09	7

Hm.

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	4·850 597	$\bar{1}$·982 926	$\bar{5}$·149 403	0·017 074	6·192 108	980 552	10
1	·833 523	·983 323	·166 477	·016 677	·172 660	980 424	1
2	·816 846	·983 616	·183 154	·016 384	·153 084	980 276	2
3	·800 462	·983 792	·199 538	·016 208	·133 360	980 113	3
4	·784 254	·983 858	·215 746	·016 142	·113 473	979 936	4
15	·768 112	·983 811	·231 888	·016 189	·093 409	979 752	15
6	·751 923	·983 648	·248 077	·016 352	·073 161	979 565	6
7	·735 571	·983 370	·264 429	·016 630	·052 726	979 381	7
8	·718 941	·982 974	·281 059	·017 026	·032 107	979 205	8
9	·701 915	·982 557	·298 085	·017 443	·011 312	979 041	9
20	·684 472	·982 302	·315 528	·017 698	5·990 353	978 878	20
1	·666 774	·982 129	·333 226	·017 871	·969 231	978 716	1
2	·648 903	·982 077	·351 097	·017 923	·947 947	978 547	2
3	·630 980	·982 112	·369 020	·017 888	·926 494	978 365	3
4	·613 092	·982 167	·386 908	·017 833	·904 859	978 170	4
25	·595 259	·982 171	·404 741	·017 829	·883 029	977 962	25
6	·577 430	·982 146	·422 570	·017 854	·860 991	977 744	6
7	·559 576	·982 051	·440 424	·017 949	·838 735	977 516	7
8	·541 627	·981 934	·458 373	·018 066	·816 251	977 281	8
9	·523 561	·981 819	·476 439	·018 181	·793 532	977 035	9
30	·505 380	·981 693	·494 620	·018 307	·770 567	976 781	30
1	·487 073	·981 607	·512 927	·018 393	·747 348	976 514	1
2	·468 680	·981 526	·531 320	·018 474	·723 862	976 234	2
3	·450 206	·981 446	·549 794	·018 554	·700 096	975 938	3
4	·431 652	·981 351	·568 348	·018 649	·676 034	975 629	4
35	·413 003	·981 232	·586 997	·018 768	·651 663	975 303	35
6	·394 235	·981 086	·605 765	·018 914	·626 966	974 962	6
7	·375 321	·980 930	·624 679	·019 070	·601 928	974 605	7
8	·356 251	·980 791	·643 749	·019 209	·576 533	974 230	8
9	·337 042	·980 659	·662 958	·019 341	·550 763	973 834	9
40	·317 701	·980 561	·682 299	·019 439	·524 597	973 413	40
1	·298 262	·980 481	·701 738	·019 519	·498 010	972 962	1
2	·278 743	·980 373	·721 257	·019 627	·470 972	972 482	2
3	·259 116	·980 200	·740 884	·019 800	·443 454	971 973	3
4	·239 316	·980 012	·760 684	·019 988	·415 427	971 431	4
45	·219 328	·979 732	·780 672	·020 268	·386 858	970 861	45
6	·199 060	·979 403	·800 940	·020 597	·357 719	970 262	6
7	·178 463	·979 068	·821 537	·020 932	·327 981	969 631	7
8	·157 531	·978 742	·842 469	·021 258	·297 612	968 964	8
9	·136 273	·978 399	·863 727	·021 601	·266 576	968 256	9
50	·114 672	·978 077	·885 328	·021 923	·234 832	967 502	50
1	·092 749	·977 759	·907 251	·022 241	·202 334	966 696	1
2	·070 508	·977 370	·929 492	·022 630	·169 030	965 833	2
3	·047 878	·976 906	·952 122	·023 094	·134 863	964 915	3
4	·024 784	·976 403	·975 216	·023 597	·099 778	963 933	4

H^M.

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·807 892	019 448	4·200 420	990 713	$\bar{5}$·799 580	009 287	10
1	·827 340	019 576	·191 133	992 590	·808 867	007 410	1
2	·846 916	019 724	·183 723	993 973	·816 277	006 027	2
3	·866 640	019 887	·177 696	994 837	·822 304	005 163	3
4	·886 527	020 064	·172 533	995 235	·827 467	004 765	4
15	·906 591	020 248	·167 768	995 174	·832 232	004 826	15
6	·926 839	020 435	·162 942	994 679	·837 058	005 321	6
7	·947 274	020 619	·157 621	993 792	·842 379	006 208	7
8	·967 893	020 795	·151 413	992 507	·848 587	007 493	8
9	·988 688	020 959	·143 920	991 199	·856 080	008 801	9
20	$\bar{6}$·009 647	021 122	·135 119	990 488	·864 881	009 512	20
1	·030 769	021 284	·125 607	990 077	·874 393	009 923	1
2	·052 053	021 453	·115 684	990 084	·884 316	009 916	2
3	·073 506	021 635	·105 768	990 382	·894 232	009 618	3
4	·095 141	021 830	·096 150	990 742	·903 850	009 258	4
25	·116 971	022 038	·086 892	990 937	·913 108	009 063	25
6	·139 009	022 256	·077 829	991 046	·922 171	008 954	6
7	·161 265	022 484	·068 875	990 939	·931 125	009 061	7
8	·183 749	022 719	·059 814	990 777	·940 186	009 223	8
9	·206 468	022 965	·050 591	990 631	·949 409	009 369	9
30	·229 433	023 219	·041 222	990 460	·958 778	009 540	30
1	·252 652	023 486	·031 682	990 415	·968 318	009 585	1
2	·276 138	023 766	·022 097	990 385	·977 903	009 615	2
3	·299 904	024 062	·012 482	990 369	·987 518	009 631	3
4	·323 966	024 371	·002 851	990 315	·997 149	009 685	4
35	·348 337	024 697	3·993 166	990 211	$\bar{4}$·006 834	009 789	35
6	·373 034	025 038	·983 377	990 043	·016 623	009 957	6
7	·398 072	025 395	·973 420	989 864	·026 580	010 136	7
8	·423 467	025 770	·963 284	989 736	·036 716	010 264	8
9	·449 237	026 166	·953 020	989 636	·046 980	010 364	9
40	·475 403	026 587	·942 656	989 621	·057 344	010 379	40
1	·501 990	027 038	·932 277	989 657	·067 723	010 343	1
2	·529 028	027 518	·921 934	989 634	·078 066	010 366	2
3	·556 546	028 027	·911 568	989 480	·088 432	010 520	3
4	·584 573	028 569	·901 048	989 303	·098 952	010 697	4
45	·613 142	029 139	·890 351	988 948	·109 649	011 052	45
6	·642 281	029 738	·879 299	988 512	·120 701	011 488	6
7	·672 019	030 369	·867 811	988 081	·132 189	011 919	7
8	·702 388	031 036	·855 892	987 692	·144 108	012 308	8
9	·733 424	031 744	·843 584	987 286	·156 416	012 714	9
50	·765 168	032 498	·830 870	986 940	·169 130	013 060	50
1	·797 666	033 304	·817 810	986 622	·182 190	013 378	1
2	·830 970	034 167	·804 432	986 194	·195 568	013 806	2
3	·865 137	035 085	·790 626	985 653	·209 374	014 347	3
4	·900 222	036 067	·776 279	985 072	·223 721	014 928	4

H^M.

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	4·001 187	1·975 828	5·998 813	0·024 172	5·063 711	962 888	55
6	3·977 015	·975 197	4·022 985	·024 803	·026 599	961 773	6
7	·952 212	·974 514	·047 788	·025 486	4·988 372	960 582	7
8	·926 726	·973 786	·073 274	·026 214	·948 954	959 306	8
9	·900 512	·972 932	·099 488	·027 068	·908 260	957 944	9
60	·873 444	·971 975	·126 556	·028 025	·866 204	956 492	60
1	·845 419	·970 918	·154 581	·029 082	·822 696	954 943	1
2	·816 337	·969 751	·183 663	·030 249	·777 639	953 294	2
3	·786 088	·968 465	·213 912	·031 535	·730 933	951 537	3
4	·754 553	·967 145	·245 447	·032 855	·682 470	949 657	4
65	·721 698	·965 776	·278 302	·034 224	·632 127	947 633	65
6	·687 474	·964 349	·312 526	·035 651	·579 760	945 445	6
7	·651 823	·962 834	·348 177	·037 166	·525 205	943 063	7
8	·614 657	·961 302	·385 343	·038 698	·468 268	940 446	8
9	·575 959	·959 415	·424 041	·040 585	·408 714	937 586	9
70	·535 374	·957 174	·464 626	·042 826	·346 300	934 479	70
1	·492 548	·954 452	·507 452	·045 548	·280 779	931 138	1
2	·447 000	·951 229	·553 000	·048 771	·211 917	927 590	2
3	·398 229	·947 496	·601 771	·052 504	·139 507	923 879	3
4	·345 725	·943 530	·654 275	·056 470	·063 386	920 009	4
75	·289 255	·940 092	·710 745	·059 908	3·983 395	915 834	75
6	·229 347	·936 216	·770 653	·063 784	·899 229	911 347	6
7	·165 563	·932 157	·834 437	·067 843	·810 576	906 493	7
8	·097 720	·927 954	·902 280	·072 046	·717 069	901 176	8
9	·025 674	·923 049	·974 326	·076 951	·618 245	895 405	9
80	2·948 723	·917 203	$\bar{3}$·051 277	·082 797	·513 650	889 275	80
1	·865 926	·910 353	·134 074	·089 647	·402 925	882 956	1
2	·776 279	·903 430	·223 721	·096 570	·285 881	876 424	2
3	·679 709	·895 762	·320 291	·104 238	·162 305	869 865	3
4	·575 471	·888 759	·424 529	·111 241	·032 170	863 065	4
85	·464 230	·882 749	·535 770	·117 251	2·895 235	855 535	85
6	·346 979	·877 347	·653 021	·122 653	·750 770	846 617	6
7	·224 326	·870 856	·775 674	·129 144	·597 387	835 928	7
8	·095 182	·866 274	·904 818	·133 726	·433 315	821 253	8
9	1·961 456	·858 265	$\bar{2}$·038 544	·141 735	·254 568	801 121	9
90	·819 721	·842 723	·180 279	·157 277	·055 689	774 993	90
1	·662 444	·822 182	·337 556	·177 818	1·830 682	739 763	1
2	·484 626	·797 094	·515 374	·202 906	·570 445	686 306	2
3	·281 720	·751 638	·718 280	·248 362	·256 751	604 368	3
4	·033 358	·677 643	·966 642	·322 357	0·861 119	465 751	4
95	0·711 001	·544 922	$\bar{1}$·288 999	·455 078	·326 870	178 159	95
6	·255 923	·249 106	·744 077	·750 894	$\bar{1}$·505 029		6
7	$\bar{1}$·505 029		0·494 971				7

Hm.

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{6}$·936 289	037 112	3·761 351	984 391	$\bar{4}$·238 649	015 609	55
6	·973 401	038 227	·745 742	983 649	·254 258	016 351	6
7	$\bar{5}$·011 628	039 418	·729 391	982 851	·270 609	017 149	7
8	·051 046	040 694	·712 242	982 012	·287 758	017 988	8
9	·091 740	042 056	·694 254	981 011	·305 746	018 989	9
60	·133 796	043 508	·675 265	979 888	·324 735	020 112	60
1	·177 304	045 057	·655 153	978 649	·344 847	021 351	1
2	·222 361	046 706	·633 802	977 290	·366 198	022 710	2
3	·269 067	048 463	·611 092	975 801	·388 908	024 199	3
4	·317 530	050 343	·586 893	974 309	·413 107	025 691	4
65	·367 873	052 367	·561 202	972 794	·438 798	027 206	65
6	·420 240	054 555	·533 996	971 245	·466 004	028 755	6
7	·474 795	056 937	·505 241	969 624	·494 759	030 376	7
8	·531 732	059 554	·474 865	968 032	·525 135	031 968	8
9	·591 286	062 414	·442 897	966 019	·557 103	033 981	9
70	·653 700	065 521	·408 916	963 599	·591 084	036 401	70
1	·719 221	068 862	·372 515	960 623	·627 485	039 377	1
2	·788 083	072 410	·333 138	957 075	·666 862	042 925	2
3	·860 493	076 121	·290 213	952 955	·709 787	047 045	3
4	·936 614	079 991	·243 168	948 618	·756 832	051 382	4
75	$\bar{4}$·016 605	084 166	·191 786	945 002	·808 214	054 998	75
6	·100 771	088 653	·136 788	940 921	·863 212	059 079	6
7	·189 424	093 507	·077 709	936 689	·922 291	063 311	7
8	·282 931	098 824	·014 398	932 360	·985 602	067 640	8
9	·381 755	104 595	2·946 758	927 279	$\bar{3}$·053 242	072 721	9
80	·486 350	110 725	·874 037	921 173	·125 963	078 827	80
1	·597 075	117 044	·795 210	913 977	·204 790	086 023	1
2	·714 119	123 576	·709 187	906 758	·290 813	093 242	2
3	·837 695	130 135	·615 945	898 743	·384 055	101 257	3
4	·967 830	136 935	·514 688	891 528	·485 312	108 472	4
85	$\bar{3}$·104 765	144 465	·406 216	885 491	·593 784	114 509	85
6	·249 230	153 383	·291 707	880 224	·708 293	119 776	6
7	·402 613	164 072	·171 931	873 869	·828 069	126 131	7
8	·566 685	178 747	·045 800	869 788	·954 200	130 212	8
9	·745 432	198 879	1·915 588	862 200	$\bar{2}$·084 412	137 800	9
90	·944 311	225 007	·777 788	846 726	·222 212	153 274	90
1	$\bar{2}$·169 318	260 237	·624 514	826 244	·375 486	173 756	1
2	·429 555	313 694	·450 758	801 428	·549 242	198 572	2
3	·743 249	395 632	·252 186	755 885	·747 814	244 115	3
4	$\bar{1}$·138 881	534 249	·008 071	681 667	·991 929	318 333	4
95	·673 130	821 841	0·689 738	548 537	$\bar{1}$·310 262	451 463	95
6	0·494 971		·238 275	251 813	·761 725	748 187	6
7			$\bar{1}$·490 088		0·509 912		7

Hm.

3½ PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	21·953 9	·223 781	·009 749	55	11·548 5	·575 656	·045 875
1	21·834 2	·227 830	·009 978	6	11·209 5	·587 120	·048 087
2	21·688 9	·232 743	·010 258	7	10·868 3	·598 658	·050 442
3	21·522 8	·238 360	·010 583	8	10·525 1	·610 261	·052 950
4	21·341 2	·244 500	·010 944	9	10·180 0	·621 932	·055 629
15	21·149 3	·250 990	·011 332	60	9·834 7	·633 610	·058 480
6	20·952 6	·257 643	·011 736	1	9·490 2	·645 258	·061 510
7	20·756 6	·264 271	·012 147	2	9·147 5	·656 848	·064 730
8	20·566 8	·270 690	·012 551	3	8·807 3	·668 350	·068 148
9	20·389 1	·276 698	·012 936	4	8·470 7	·679 736	·071 773
20	20·224 6	·282 259	·013 299	65	8·136 3	·691 042	·075 637
1	20·065 8	·287 629	·013 654	6	7·803 4	·702 299	·079 775
2	19·908 7	·292 941	·014 010	7	7·471 1	·713 539	·084 233
3	19·747 5	·298 392	·014 382	8	7·138 6	·724 783	·089 055
4	19·577 9	·304 129	·014 780	9	6·803 8	·736 102	·094 326
25	19·398 6	·310 194	·015 207	70	6·470 3	·747 380	·100 047
6	19·211 5	·316 519	·015 660	1	6·140 9	·758 521	·106 222
7	19·017 7	·323 072	·016 139	2	5·819 9	·769 375	·112 813
8	18·820 2	·329 751	·016 637	3	5·511 6	·779 801	·119 756
9	18·619 6	·336 535	·017 153	4	5·219 9	·789 666	·126 958
30	18·415 6	·343 433	·017 688	75	4·944 7	·798 971	·134 400
1	18·208 5	·350 437	·018 244	6	4·676 1	·808 056	·142 362
2	17·996 2	·357 616	·018 826	7	4·415 8	·816 856	·150 827
3	17·778 3	·364 986	·019 437	8	4·162 4	·825 425	·159 890
4	17·554 2	·372 562	·020 080	9	3·913 5	·833 842	·169 703
35	17·324 5	·380 332	·020 755	80	3·672 2	·842 003	·180 215
6	17·089 5	·388 277	·021 464	1	3·443 5	·849 737	·191 232
7	16·850 3	·396 368	·022 205	2	3·233 0	·856 856	·202 424
8	16·606 6	·404 606	·022 980	3	3·038 1	·863 448	·213 828
9	16·357 6	·413 026	·023 795	4	2·862 2	·869 395	·225 104
40	16·102 6	·421 652	·024 654	85	2·697 8	·874 955	·236 617
1	15·839 7	·430 541	·025 567	6	2·533 9	·880 496	·249 156
2	15·567 9	·439 735	·026 541	7	2·360 8	·886 349	·263 731
3	15·287 6	·449 213	·027 580	8	2·178 4	·892 519	·280 810
4	15·000 7	·458 915	·028 681	9	1·963 9	·899 773	·303 580
45	14·707 2	·468 838	·029 849	90	1·721 7	·907 960	·333 595
6	14·409 8	·478 894	·031 077	1	1·473 1	·916 368	·370 531
7	14·109 7	·489 044	·032 366	2	1·218 5	·924 979	·416 942
8	13·806 4	·499 300	·033 722	3	·944 1	·934 256	·480 553
9	13·499 0	·509 695	·035 154	4	·672 6	·943 438	·564 053
50	13·187 4	·520 232	·036 669	95	·412 9	·952 219	·673 936
1	12·870 2	·530 959	·038 281	6	·177 5	·960 178	·815 464
2	12·546 5	·541 906	·040 003	7		·966 184	·966 184
3	12·217 6	·553 029	·041 840				
4	11·884 9	·564 280	·043 794				

H^{M}.

FOUR PER-CENT.

H^M.
4 PER-CENT.
Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	67 556·4	1 356 297	24 434 671	12 792·8	429 295·1	10
1	64 639·8	1 291 658	23 078 374	12 474·5	416 502·2	1
2	61 905·7	1 229 752	21 786 716	12 226·6	404 027·7	2
3	59 327·1	1 170 425	20 556 964	12 029·0	391 801·2	3
4	56 879·0	1 113 546	19 386 540	11 862·6	379 772·2	4
15	54 540·3	1 059 005	18 272 994	11 711·6	367 909·6	15
6	52 292·0	1 006 713	17 213 988	11 561·1	356 198·0	6
7	50 117·6	956 595·8	16 207 275	11 397·8	344 636·9	7
8	48 002·9	908 593·0	15 250 679	11 210·7	333 239·1	8
9	45 935·4	862 657·6	14 342 086	10 989·5	322 028·4	9
20	43 914·9	818 742·6	13 479 429	10 735·8	311 038·8	20
1	41 958·6	776 784·0	12 660 686	10 468·5	300 303·1	1
2	40 073·5	736 710·5	11 883 902	10 197·2	289 834·5	2
3	38 268·5	698 442·0	11 147 192	9 933·49	279 637·3	3
4	36 547·8	661 894·2	10 448 750	9 684·60	269 703·8	4
25	34 908·7	626 985·5	9 786 855	9 451·27	260 019·2	25
6	33 343·6	593 641·9	9 159 870	9 228·73	250 567·9	6
7	31 846·8	561 795·1	8 566 228	9 014·40	241 339·2	7
8	30 410·5	531 384·7	8 004 433	8 802·97	232 324·8	8
9	29 031·1	502 353·5	7 473 048	8 593·27	223 521·8	9
30	27 707·1	474 646·5	6 970 695	8 385·77	214 928·6	30
1	26 435·7	448 210·8	6 496 048	8 180·02	206 542·8	1
2	25 217·7	422 993·2	6 047 838	7 978·77	198 362·8	2
3	24 051·2	398 941·9	5 624 844	7 782·25	190 384·0	3
4	22 934·6	376 007·4	5 225 902	7 590·64	182 601·8	4
35	21 864·9	354 142·4	4 849 895	7 403·12	175 011·1	35
6	20 839·5	333 302·9	4 495 753	7 218·66	167 608·0	6
7	19 855·5	313 447·4	4 162 450	7 036·14	160 389·3	7
8	18 911·1	294 536·3	3 849 002	6 855·46	153 353·2	8
9	18 005·9	276 530·4	3 554 466	6 677·62	146 497·7	9
40	17 138·9	259 391·5	3 277 936	6 503·07	139 820·1	40
1	16 309·8	243 081·7	3 018 544	6 333·24	133 317·0	1
2	15 518·1	227 563·6	2 775 463	6 168·78	126 983·8	2
3	14 761·1	212 802·5	2 547 899	6 008·61	120 815·0	3
4	14 035·4	198 767·2	2 335 096	5 850·68	114 806·4	4
45	13 339·6	185 427·5	2 136 329	5 694·72	108 955·7	45
6	12 670·2	172 757·4	1 950 902	5 538·34	103 261·0	6
7	12 025·2	160 732·2	1 778 144	5 380·69	97 722·69	7
8	11 404·3	149 327·9	1 617 412	5 222·25	92 342·01	8
9	10 807·3	138 520·6	1 468 084	5 063·91	87 119·76	9
50	10 233·5	128 287·2	1 329 564	4 905·75	82 055·85	50
1	9 682·92	118 604·2	1 201 276	4 748·80	77 150·10	1
2	9 155·30	109 448·9	1 082 672	4 593·59	72 401·30	2
3	8 648·68	100 800·3	973 223·3	4 439·11	67 807·70	3
4	8 161·36	92 638·91	872 423·0	4 284·42	63 368·60	4

Hᴍ.

4 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	7 692·59	84 946·32	779 784·1	4 129·56	59 084·17	55
6	7 241·15	77 705·17	694 837·8	3 973·98	54 954·61	6
7	6 806·31	70 898·86	617 132·6	3 817·65	50 980·63	7
8	6 387·53	64 511·33	546 233·8	3 660·65	47 162·98	8
9	5 984·46	58 526·87	481 722·4	3 503·26	43 502·34	9
60	5 595·83	52 931·04	423 195·6	3 344·79	39 999·08	60
1	5 220·92	47 710·12	370 264·5	3 185·11	36 654·29	1
2	4 859·28	42 850·85	322 554·4	3 024·27	33 469·18	2
3	4 510·55	38 340·30	279 703·6	2 862·44	30 444·91	3
4	4 174·47	34 165·83	241 363·3	2 699·84	27 582·47	4
65	3 851·71	30 314·12	207 197·4	2 537·64	24 882·62	65
6	3 542·72	26 771·40	176 883·3	2 376·79	22 344·99	6
7	3 247·83	23 523·58	150 111·9	2 218·16	19 968·20	7
8	2 967·11	20 556·47	126 588·3	2 062·36	17 750·04	8
9	2 701·11	17 855·35	106 031·9	1 910·48	15 687·68	9
70	2 448·30	15 407·05	88 176·53	1 761·56	13 777·20	70
1	2 207·73	13 199·32	72 769·47	1 615·15	12 015·65	1
2	1 978·36	11 220·97	59 570·15	1 470·69	10 400·50	2
3	1 759·71	9 461·258	48 349·18	1 328·13	8 929·809	3
4	1 551·83	7 909·431	38 887·92	1 187·93	7 601·675	4
75	1 356·07	6 553·366	30 978·49	1 051·86	6 413·742	75
6	1 175·66	5 377·711	24 425·13	923·602	5 361·886	6
7	1 010.19	4 367·521	19 047·42	803.355	4 438·284	7
8	859·938	3 507·583	14 679·90	691·957	3 634·928	8
9	724·983	2 782·600	11 172·31	590·076	2 942·972	9
80	604·344	2 178·256	8 389·713	497·321	2 352·895	80
1	497·043	1 681·213	6 211·457	413·264	1 855·575	1
2	402·396	1 278·817	4 530·244	337·734	1 442·311	2
3	320·620	958·197 3	3 251·427	271·435	1 104·577	3
4	250·992	707·205 3	2 293·230	214·138	833·143	4
85	193·342	513·863 5	1 586·024	166·142	619·004	85
6	146·887	366·976 9	1 072·161	127·123	452·863	6
7	110·214	256·763 1	705·184	96·099 3	325·740	7
8	81·470 3	175·292 8	448·421	71·594 8	229·641	8
9	59·590 8	115·702 0	273·128	52·848 8	158·046	9
90	42·791 0	72·911 0	157·426	38·340 9	105·197	90
1	29·647 1	43·263 9	84·515	26·842 8	66·856	1
2	19·591 7	23·672 2	41·251	17·927 7	40·013	2
3	12·220 0	11·452 2	17·579	11·309 6	22·086	3
4	6·864 6	4·587 6	6·124	6·424 2	10·776	4
95	3·252 1	1·335 5	1·536	3·075 7	4·352	95
6	1·135 0	·200 5	·201	1·083 6	1·276	6
7	·200 5	·000 0	·000	·192 7	·193	7

H^{M}.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ .	x
10	4·829 667	$\bar{1}$·980 833	5·170 333	0·019 167	6·132 355	978 792	10
1	·810 500	·981 231	·189 500	·018 769	·111 147	978 671	1
2	·791 731	·981 522	·208 269	·018 478	·089 818	978 525	2
3	·773 253	·981 699	·226 747	·018 301	·068 343	978 365	3
4	·754 952	·981 766	·245 048	·018 234	·046 708	978 190	4
15	·736 718	·981 718	·263 282	·018 282	·024 898	978 008	15
6	·718 436	·981 554	·281 564	·018 446	·002 906	977 823	6
7	·699 990	·981 277	·300 010	·018 723	5·980 729	977 640	7
8	·681 267	·980 881	·318 733	·019 119	·958 369	977 470	8
9	·662 148	·980 464	·337 852	·019 536	·935 839	977 308	9
20	·642 612	·980 209	·357 388	·019 791	·913 147	977 153	20
1	·622 821	·980 037	·377 179	·019 963	·890 300	976 997	1
2	·602 858	·979 984	·397 142	·020 016	·867 297	976 833	2
3	·582 842	·980 019	·417 158	·019 981	·844 130	976 659	3
4	·562 861	·980 073	·437 139	·019 927	·820 789	976 469	4
25	·542 934	·980 078	·457 066	·019 922	·797 258	976 267	25
6	·523 012	·980 054	·476 988	·019 946	·773 525	976 053	6
7	·503 066	·979 957	·496 934	·020 043	·749 578	975 831	7
8	·483 023	·979 841	·516 977	·020 159	·725 409	975 601	8
9	·462 864	·979 726	·537 136	·020 274	·701 010	975 360	9
30	·442 590	·979 600	·557 410	·020 400	·676 370	975 112	30
1	·422 190	·979 515	·577 810	·020 485	·651 482	974 851	1
2	·401 705	·979 432	·598 295	·020 568	·626 333	974 577	2
3	·381 137	·979 354	·618 863	·020 646	·600 910	974 286	3
4	·360 491	·979 257	·639 509	·020 743	·575 196	973 982	4
35	·339 748	·979 140	·660 252	·020 860	·549 178	973 661	35
6	·318 888	·978 993	·681 112	·021 007	·522 839	973 326	6
7	·297 881	·978 837	·702 119	·021 163	·496 165	972 974	7
8	·276 718	·978 698	·723 282	·021 302	·469 139	972 604	8
9	·255 416	·978 566	·744 584	·021 434	·441 743	972 213	9
40	·233 982	·978 468	·766 018	·021 532	·413 956	971 796	40
1	·212 450	·978 388	·787 550	·021 612	·385 752	971 351	1
2	·190 838	·978 279	·809 162	·021 721	·357 103	970 874	2
3	·169 117	·978 108	·830 883	·021 892	·327 977	970 368	3
4	·147 225	·977 918	·852 775	·022 082	·298 345	969 829	4
45	·125 143	·977 639	·874 857	·022 361	·268 174	969 263	45
6	·102 782	·977 310	·897 218	·022 690	·237 437	968 666	6
7	·080 092	·976 975	·919 908	·023 025	·206 103	968 038	7
8	·057 067	·976 650	·942 933	·023 350	·174 141	967 374	8
9	·033 717	·976 306	·966 283	·023 694	·141 515	966 668	9
50	·010 023	·975 983	·989 977	·024 017	·108 183	965 917	50
1	3·986 006	·975 667	$\bar{4}$·013 994	·024 333	·074 100	965 112	1
2	·961 673	·975 277	·038 327	·024 723	·039 212	964 250	2
3	·936 950	·974 812	·063 050	·025 188	·003 462	963 331	3
4	·911 762	·974 311	·088 238	·025 689	4·966 793	962 352	4

H^M.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·867 645	021 208	4·106 966	989 058	$\bar{5}$·893 034	010 942	10
1	·888 853	021 329	·096 024	991 280	·903 976	008 720	1
2	·910 182	021 475	·087 304	992 924	·912 696	007 076	2
3	·931 657	021 635	·080 228	993 954	·919 772	006 046	3
4	·953 292	021 810	·074 182	994 435	·925 818	005 565	4
15	·975 102	021 992	·068 617	994 381	·931 383	005 619	15
6	·997 094	022 177	·062 998	993 823	·937 002	006 177	6
7	$\bar{6}$·019 271	022 360	·056 821	992 813	·943 179	007 187	7
8	·041 631	022 530	·049 634	991 345	·950 366	008 655	8
9	·064 161	022 692	·040 979	989 855	·959 021	010 145	9
20	·086 853	022 847	·030 834	989 052	·969 166	010 948	20
1	·109 700	023 003	·019 886	988 596	·980 114	011 404	1
2	·132 703	023 167	·008 482	988 620	·991 518	011 380	2
3	·155 870	023 341	3·997 102	988 980	$\bar{4}$·002 898	011 020	3
4	·179 211	023 531	·986 082	989 408	·013 918	010 592	4
25	·202 742	023 733	·975 490	989 652	·024 510	010 348	25
6	·226 475	023 947	·965 142	989 795	·034 858	010 205	6
7	·250 422	024 169	·954 937	989 692	·045 063	010 308	7
8	·274 591	024 399	·944 629	989 529	·055 371	010 471	8
9	·298 990	024 640	·934 158	989 385	·065 842	010 615	9
30	·323 630	024 888	·923 543	989 212	·076 457	010 788	30
1	·348 518	025 149	·912 755	989 181	·087 245	010 819	1
2	·373 667	025 423	·901 936	989 169	·098 064	010 831	2
3	·399 090	025 714	·891 105	989 174	·108 895	010 826	3
4	·424 804	026 018	·880 279	989 136	·119 721	010 864	4
35	·450 822	026 339	·869 415	989 042	·130 585	010 958	35
6	·477 161	026 674	·858 457	988 878	·141 543	011 122	6
7	·503 835	027 026	·847 335	988 702	·152 665	011 298	7
8	·530 861	027 396	·836 037	988 585	·163 963	011 415	8
9	·558 257	027 787	·824 622	988 497	·175 378	011 503	9
40	·586 044	028 204	·813 119	988 507	·186 881	011 493	40
1	·614 248	028 649	·801 626	988 573	·198 374	011 427	1
2	·642 897	029 126	·790 199	988 575	·209 801	011 425	2
3	·672 023	029 632	·778 774	988 432	·221 226	011 568	3
4	·701 655	030 171	·767 206	988 266	·232 794	011 734	4
45	·731 826	030 737	·755 472	987 907	·244 528	012 093	45
6	·762 563	031 334	·743 379	987 459	·256 621	012 541	6
7	·793 897	031 962	·730 838	987 020	·269 162	012 980	7
8	·825 859	032 626	·717 858	986 628	·282 142	013 372	8
9	·858 485	033 332	·704 486	986 219	·295 514	013 781	9
50	·891 817	034 083	·690 705	985 879	·309 295	014 121	50
1	·925 900	034 888	·676 584	985 569	·323 416	014 431	1
2	·960 788	035 750	·662 153	985 142	·337 847	014 858	2
3	·996 538	036 669	·647 295	984 597	·352 705	015 403	3
4	$\bar{5}$·033 207	037 648	·631 892	984 012	·368 108	015 988	4

Hᴹ.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·886 073	$\bar{1}$·973 734	$\bar{4}$·113 927	0·026 266	4·929 145	961 305	55
6	·859 807	·973 105	·140 193	·026 895	·890 450	960 189	6
7	·832 912	·972 421	·167 088	·027 579	·850 639	958 997	7
8	·805 333	·971 692	·194 667	·028 308	·809 636	957 719	8
9	·777 025	·970 839	·222 975	·029 161	·767 355	956 355	9
60	·747 864	·969 883	·252 136	·030 117	·723 710	954 901	60
1	·717 747	·968 825	·282 253	·031 175	·678 611	953 349	1
2	·686 572	·967 657	·313 428	·032 343	·631 960	951 696	2
3	·654 229	·966 372	·345 771	·033 628	·583 656	949 936	3
4	·620 601	·965 052	·379 399	·034 948	·533 592	948 053	4
65	·585 653	·963 684	·414 347	·036 316	·481 645	946 026	65
6	·549 337	.962 256	·450 663	·037 744	·427 671	943 832	6
7	·511 593	·960 741	·488 407	·039 259	·371 503	941 445	7
8	·472 334	·959 209	·527 666	·040 791	·312 948	938 821	8
9	·431 543	·957 322	·568 457	·042 678	·251 769	935 951	9
70	·388 865	·955 080	·611 135	·044 920	·187 720	932 832	70
1	·343 945	·952 360	·656 055	·047 640	·120 552	929 478	1
2	·296 305	·949 136	·703 695	·050 864	·050 030	925 919	2
3	·245 441	·945 402	·754 559	·054 598	3·975 949	922 196	3
4	·190 843	·941 438	·809 157	·058 562	·898 145	918 319	4
75	·132 281	·937 999	·867 719	·062 001	·816 464	914 134	75
6	·070 280	·934 123	·929 720	·065 877	·730 598	909 637	6
7	·004 403	·930 064	·995 597	·069 936	·640 235	904 773	7
8	2·934 467	·925 861	$\bar{3}$·065 533	·074 139	·545 008	899 443	8
9	·860 328	·920 956	·139 672	·079 044	·444 451	893 658	9
80	·781 284	·915 110	·218 716	·084 890	·338 109	887 514	80
1	·696 394	·908 260	·303 606	·091 740	·225 623	881 186	1
2	·604 654	·901 337	·395 346	·098 663	·106 809	874 646	2
3	·505 991	·893 669	·494 009	·106 331	2·981 455	868 091	3
4	·399 660	·886 666	·600 340	·113 334	·849 546	861 302	4
85	·286 326	·880 656	·713 674	·119 344	·710 848	853 791	85
6	·166 982	·875 254	·833 018	·124 746	·564 639	844 894	6
7	·042 236	·868 763	·957 764	·131 237	·409 533	834 231	7
8	1·910 999	·864 181	$\bar{2}$·089 001	·135 819	·243 764	819 577	8
9	·775 180	·856 172	·224 820	·143 828	·063 341	799 452	9
90	·631 352	·840 630	·368 648	·159 370	1·862 793	773 332	90
1	·471 982	·820 089	·528 018	·179 911	·636 125	738 114	1
2	·292 071	·795 001	·707 929	·204 999	·374 239	684 650	2
3	·087 072	·749 545	·912 928	·250 455	·058 889	602 694	3
4	0·836 617	·675 550	1·163 383	·324 450	0·661 583	464 045	4
95	·512 167	·542 829	·487 833	·457 171	·125 628	176 381	95
6	·054 996	·247 013	·945 004	·752 987	$\bar{1}$·302 009		6
7	1·302 009		0·697 991				7

H^{M}.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·070 855	038 695	3·615 904	983 322	$\bar{4}$·384 096	016 678	55
6	·109 550	039 811	·599 226	982 570	·400 774	017 430	6
7	·149 361	041 003	·581 796	981 762	·418 204	018 238	7
8	·190 364	042 281	·563 558	980 914	·436 442	019 086	8
9	·232 645	043 645	·544 472	979 897	·455 528	020 103	9
60	·276 290	045 099	·524 369	978 755	·475 631	021 245	60
1	·321 389	046 651	·503 124	977 497	·496 876	022 503	1
2	·368 040	048 304	·480 621	976 115	·519 379	023 885	2
3	·416 344	050 064	·456 736	974 602	·543 264	025 398	3
4	·466 408	051 947	·431 338	973 092	·568 662	026 908	4
65	·518 355	053 974	·404 430	971 561	·595 570	028 439	65
6	·572 329	056 168	·375 991	970 001	·624 009	029 999	6
7	·628 497	058 555	·345 992	968 372	·654 008	031 628	7
8	·687 052	061 179	·314 364	966 779	·685 636	033 221	8
9	·748 231	064 049	·281 143	964 754	·718 857	035 246	9
70	·812 280	067 168	·245 897	962 315	·754 103	037 685	70
1	·879 448	070 522	·208 212	959 309	·791 788	040 691	1
2	·949 970	074 081	·167 521	955 721	·832 479	044 279	2
3	$\bar{4}$·024 051	077 804	·123 242	951 550	·876 758	048 450	3
4	·101 855	081 681	·074 792	947 165	·925 208	052 835	4
75	·183 536	085 866	·021 957	943 528	·978 043	056 472	75
6	·269 402	090 363	2·965 485	939 423	$\bar{3}$·034 515	060 577	6
7	·359 765	095 227	·904 908	935 171	·095 092	064 829	7
8	·454 992	100 557	·840 079	930 829	·159 921	069 171	8
9	·555 549	106 342	·770 908	925 729	·229 092	074 271	9
80	·661 891	112 486	·696 637	919 590	·303 363	080 410	80
1	·774 377	118 814	·616 227	912 348	·383 773	087 652	1
2	·893 191	125 354	·528 575	905 090	·471 425	094 910	2
3	$\bar{3}$·018 545	131 909	·433 665	897 029	·566 335	102 971	3
4	·150 454	138 698	·330 694	889 784	·669 306	110 216	4
85	·289 152	146 209	·220 478	883 745	·779 522	116 255	85
6	·435 361	155 106	·104 223	878 497	·895 777	121 503	6
7	·590 467	165 769	1·982 720	872 162	$\bar{2}$·017 280	127 838	7
8	·756 236	180 423	·854 882	868 154	·145 118	131 846	8
9	·936 659	200 548	·723 036	860 627	·276 964	139 373	9
90	$\bar{2}$·137 207	226 668	·583 663	845 165	·416 337	154 835	90
1	·363 875	261 886	·428 828	824 696	·571 172	175 304	1
2	·625 761	315 350	·253 524	799 921	·746 476	200 079	2
3	·941 111	397 306	·053 445	754 371	·946 555	245 629	3
4	$\bar{1}$·338 417	535 955	0·807 816	680 125	$\bar{1}$·192 184	319 875	4
95	·874 372	823 619	·487 941	546 942	·512 059	453 058	95
6	0·697 991		·034 883	250 092	·965 117	749 908	6
7			$\bar{1}$·284 975		0·715 025		7

H^{M}.

4 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	20·0765	·189365	·008985	55	11·0426	·536823	·044577
1	19·9824	·192985	·009197	6	10·7311	·548805	·046782
2	19·8649	·197503	·009466	7	10·4167	·560899	·049130
3	19·7283	·202757	·009782	8	10·0996	·573093	·051632
4	19·5775	·208559	·010135	9	9·7798	·585392	·054305
15	19·4169	·214733	·010517	60	9·4590	·597730	·057150
6	19·2518	·221086	·010917	1	9·1383	·610067	·060175
7	19·0870	·227422	·011322	2	8·8184	·622371	·063388
8	18·9279	·233543	·011719	3	8·5001	·634610	·066800
9	18·7798	·239239	·012095	4	8·1845	·646751	·070418
20	18·6438	·244468	·012445	65	7·8703	·658834	·074274
1	18·5131	·249497	·012786	6	7·5567	·670894	·078405
2	18·3840	·254463	·013127	7	7·2429	·682966	·082855
3	18·2511	·259574	·013484	8	6·9281	·695073	·087672
4	18·1104	·264985	·013866	9	6·6104	·707294	·092938
25	17·9607	·270742	·014279	70	6·2930	·719502	·098657
6	17·8038	·276777	·014719	1	5·9787	·731589	·104832
7	17·6406	·283055	·015185	2	5·6719	·743390	·111422
8	17·4737	·289472	·015669	3	5·3766	·754746	·118362
9	17·3039	·296002	·016171	4	5·0969	·765506	·125558
30	17·1309	·302658	·016693	75	4·8326	·775668	·132988
1	16·9548	·309432	·017234	6	4·5742	·785606	·140935
2	16·7737	·316396	·017801	7	4·3235	·795251	·149386
3	16·5872	·323570	·018398	8	4·0789	·804659	·158432
4	16·3948	·330969	·019027	9	3·8382	·813917	·168229
35	16·1968	·338584	·019689	80	3·6043	·822910	·178725
6	15·9938	·346393	·020384	1	3·3824	·831445	·189722
7	15·7864	·354368	·021110	2	3·1780	·839307	·200887
8	15·5747	·362509	·021871	3	2·9886	·846593	·212254
9	15·3577	·370857	·022672	4	2·8176	·853167	·223480
40	15·1347	·379434	·023517	85	2·6578	·859316	·234927
1	14·9040	·388308	·024416	6	2·4984	·865448	·247386
2	14·6644	·397522	·025377	7	2·3297	·871935	·261867
3	14·4165	·407058	·026404	8	2·1516	·878784	·278836
4	14·1619	·416852	·027494	9	1·9416	·886862	·301489
45	13·9005	·426903	·028650	90	1·7039	·896004	·331376
6	13·6350	·437116	·029868	1	1·4593	·905412	·368159
7	13·3663	·447451	·031146	2	1·2083	·915066	·414380
8	13·0940	·457921	·032490	3	·9372	·925493	·477756
9	12·8173	·468564	·033911	4	·6683	·935835	·560954
50	12·5360	·479383	·035415	95	·4106	·945745	·670437
1	12·2488	·490431	·037017	6	·1766	·954746	·811438
2	11·9547	·501742	·038730	7		·961539	·961539
3	11·6550	·513270	·040559				
4	11·3509	·524964	·042504				

H[M].

FOUR AND A HALF PER-CENT.

H^M.

4½ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	64 392·8	1 188 642	20 229 255	10 434·33	327 960·1	10
1	61 317·9	1 127 324	19 040 613	10 132·39	317 525·8	1
2	58 443·4	1 068 881	17 913 289	9 898·29	307 393·4	2
3	55 741·0	1 013 140	16 844 408	9 712·65	297 495·1	3
4	53 185·2	959 954·7	15 831 268	9 557·14	287 782·5	4
15	50 754·3	909 200·3	14 871 313	9 416·59	278 225·4	15
6	48 429·3	860 771·0	13 962 113	9 277·15	268 808·8	6
7	46 193·4	814 577·6	13 101 342	9 126·68	259 531·6	7
8	44 032·6	770 545·1	12 286 764	8 955·07	250 404·9	8
9	41 934·5	728 610·6	11 516 219	8 753·15	241 449·9	9
20	39 898·2	688 712·4	10 787 609	8 522·61	232 696·7	20
1	37 938·4	650 773·9	10 098 896	8 280·96	224 174·1	1
2	36 060·6	614 713·3	9 448 122	8 036·81	215 893·2	2
3	34 271·5	580 441·8	8 833 409	7 800·64	207 856·3	3
4	32 573·9	547 867·9	8 252 967	7 578·80	200 055·7	4
25	30 964·2	516 903·7	7 705 099	7 371·84	192 476·9	25
6	29 434·4	487 469·3	7 188 196	7 175·39	185 105·1	6
7	27 978·6	459 490·7	6 700 726	6 987·09	177 929·7	7
8	26 588·9	432 901·8	6 241 236	6 802·23	170 942·6	8
9	25 261·5	407 640·3	5 808 334	6 619·76	164 140·4	9
30	23 994·0	383 646·3	5 400 694	6 440·07	157 520·6	30
1	22 783·4	360 862·9	5 017 047	6 262·75	151 080·5	1
2	21 629·7	339 233·2	4 656 185	6 090·13	144 817·8	2
3	20 530·5	318 702·7	4 316 951	5 922·38	138 727·6	3
4	19 483·7	299 219·1	3 998 249	5 759·60	132 805·3	4
35	18 486·1	280 733·0	3 699 030	5 601·05	127 045·7	35
6	17 534·8	263 198·2	3 418 297	5 445·85	121 444·6	6
7	16 626·9	246 571·3	3 155 098	5 293·01	115 998·8	7
8	15 760·3	230 810·9	2 908 527	5 142·43	110 705·8	8
9	14 934·2	215 876·8	2 677 716	4 994·93	105 563·3	9
40	14 147·0	201 729·8	2 461 839	4 850·85	100 568·4	40
1	13 398·3	188 331·5	2 260 110	4 711·33	95 717·54	1
2	12 686·9	175 644·7	2 071 778	4 576·88	91 006·21	2
3	12 010·2	163 634·5	1 896 133	4 446·56	86 429·33	3
4	11 365·1	152 269·3	1 732 499	4 318·68	81 982·77	4
45	10 750·1	141 519·3	1 580 230	4 192·99	77 664·09	45
6	10 161·7	131 357·6	1 438 710	4 067·57	73 471·10	6
7	9 598·29	121 759·3	1 307 353	3 941·74	69 403·53	7
8	9 059·11	112 700·2	1 185 594	3 815·88	65 461·79	8
9	8 543·82	104 156·4	1 072 893	3 690·70	61 645·91	9
50	8 051·47	96 104·90	968 737·0	3 566·27	57 955·20	50
1	7 581·86	88 523·03	872 632·1	3 443·37	54 388·94	1
2	7 134·43	81 388·61	784 109·1	3 322·43	50 945·56	2
3	6 707·39	74 681·22	702 720·4	3 202·61	47 623·14	3
4	6 299·17	68 382·05	628 039·2	3 083·23	44 420·52	4

Hm.

4½ PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	5 908·95	62 473·10	559 657·2	2 964·27	41 337·29	55
6	5 535·57	56 937·53	497 184·1	2 845·34	38 373·02	6
7	5 178·26	51 759·28	440 246·5	2 726·40	35 527·69	7
8	4 836·39	46 922·89	388 487·3	2 607·52	32 801·29	8
9	4 509·53	42 413·36	341 564·4	2 488·92	30 193·76	9
60	4 196·50	38 216·86	299 151·0	2 370·09	27 704·84	60
1	3 896·61	34 320·25	260 934·2	2 250·91	25 334·75	1
2	3 609·35	30 710·90	226 613·9	2 131·44	23 083·85	2
3	3 334·29	27 376·61	195 903·0	2 011·81	20 952·40	3
4	3 071·09	24 305·52	168 526·4	1 892·19	18 940·59	4
65	2 820·08	21 485·44	144 220·9	1 773·43	17 048·40	65
6	2 581·44	18 904·00	122 735·4	1 656·23	15 274·97	6
7	2 355·24	16 548·77	103 831·4	1 541·19	13 618·74	7
8	2 141·38	14 407·39	87 282·66	1 428·75	12 077·55	8
9	1 940·08	12 467·31	72 875·28	1 319·66	10 648·80	9
70	1 750·08	10 717·23	60 407·97	1 213·21	9 329·138	70
1	1 570·57	9 146·663	49 690·74	1 109·06	8 115·927	1
2	1 400·66	7 746·005	40 544·08	1 006·78	7 006·870	2
3	1 239·90	6 506·108	32 798·07	906·337	6 000·088	3
4	1 088·19	5 417·918	26 291·96	808·023	5 093·751	4
75	946·366	4 471·552	20 874·04	713·059	4 285·728	75
6	816·536	3 655·016	16 402·49	623·981	3 572·669	6
7	698·258	2 956·758	12 747·48	540·865	2 948·688	7
8	591·558	2 365·200	9 790·717	464·233	2 407·823	8
9	496·335	1 868·865	7 425·517	394·484	1 943·590	9
80	411·764	1 457·102	5 556·652	331·286	1 549·106	80
1	337·035	1 120·067	4 099·550	274·289	1 217·820	1
2	271·551	848·516	2 979·482	223·319	943·531	2
3	215·331	633·186	2 130·966	178·792	720·213	3
4	167·761	465·424	1 497·781	140·495	541·421	4
85	128·610	336·814	1 032·357	108·568	400·926	85
6	97·240 8	239·573	695·543	82·736 8	292·358	6
7	72·613 8	166·960	455·969	62·297 2	209·622	7
8	53·419 4	113·540	289·010	46·229 8	147·324	8
9	38·886 3	74·654	175·470	33·997 0	101·095	9
90	27·789 9	46·864	100·816	24·575 1	67·097	90
1	19·161 7	27·702	53·952	17·143 6	42·522	1
2	12·602 0	15·100	26·250	11·409 1	25·379	2
3	7·822 7	7·278	11·150	7·172 4	13·970	3
4	4·373 4	2·904	3·872	4·060 0	6·797	4
95	2·062 0	·842	·968	1·936 9	2·737	95
6	·716 2	·126	·126	·679 9	·800	6
7	·125 9	·000	·000	·120 5	·121	7

Hm.

4½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	4·808 837	1·978 751	5·191 163	0·021 249	6·075 051	976 998	10
1	·787 588	·979 147	·212 412	·020 853	·052 049	976 880	1
2	·766 735	·979 440	·233 265	·020 560	·028 929	976 740	2
3	·746 175	·979 616	·253 825	·020 384	·005 669	976 582	3
4	·725 791	·979 682	·274 209	·020 318	5·982 251	976 409	4
15	·705 473	·979 635	·294 527	·020 365	·958 660	976 228	15
6	·685 108	·979 472	·314 892	·020 528	·934 888	976 044	6
7	·664 580	·979 194	·335 420	·020 806	·910 932	975 866	7
8	·643 774	·978 798	·356 226	·021 202	·886 798	975 698	8
9	·622 572	·978 381	·377 428	·021 619	·862 496	975 542	9
20	·600 953	·978 126	·399 047	·021 874	·838 038	975 392	20
1	·579 079	·977 954	·420 921	·022 046	·813 430	975 243	1
2	·557 033	·977 901	·442 967	·022 099	·788 673	975 086	2
3	·534 934	·977 936	·465 066	·022 064	·763 759	974 917	3
4	·512 870	·977 990	·487 130	·022 010	·738 676	974 734	4
25	·490 860	·977 995	·509 140	·022 005	·713 410	974 537	25
6	·468 855	·977 971	·531 145	·022 029	·687 947	974 330	6
7	·446 826	·977 875	·553 174	·022 125	·662 277	974 112	7
8	·424 701	·977 758	·575 299	·022 242	·636 389	973 888	8
9	·402 459	·977 643	·597 541	·022 357	·610 277	973 654	9
30	·380 102	·977 517	·619 898	·022 483	·583 931	973 411	30
1	·357 619	·977 431	·642 381	·022 569	·557 342	973 156	1
2	·335 050	·977 350	·664 950	·022 650	·530 498	972 888	2
3	·312 400	·977 270	·687 600	·022 730	·503 386	972 603	3
4	·289 670	·977 175	·710 330	·022 825	·475 989	972 304	4
35	·266 845	·977 057	·733 155	·022 943	·448 293	971 990	35
6	·243 902	·976 909	·756 098	·023 091	·420 283	971 660	6
7	·220 811	·976 755	·779 189	·023 245	·391 943	971 313	7
8	·197 566	·976 615	·802 434	·023 385	·363 256	970 950	8
9	·174 181	·976 483	·825 819	·023 517	·334 206	970 564	9
40	·150 664	·976 385	·849 336	·023 615	·304 770	970 153	40
1	·127 049	·976 305	·872 951	·023 695	·274 923	969 712	1
2	·103 354	·976 196	·896 646	·023 804	·244 635	969 240	2
3	·079 550	·976 025	·920 450	·023 975	·213 875	968 738	3
4	·055 575	·975 835	·944 425	·024 165	·182 613	968 203	4
45	·031 410	·975 556	5·968 590	·024 444	5·150 816	967 639	45
6	·006 966	·975 228	·993 034	·024 772	·118 455	967 047	6
7	3·982 194	·974 891	4·017 806	·025 109	·085 502	966 423	7
8	·957 085	·974 567	·042 915	·025 433	·051 925	965 761	8
9	·931 652	·974 223	·068 348	·025 777	·017 686	965 060	9
50	·905 875	·973 901	·094 125	·026 099	4·982 746	964 310	50
1	·879 776	·973 583	·120 224	·026 417	·947 056	963 508	1
2	·853 359	·973 194	·146 641	·026 806	·910 564	962 647	2
3	·826 553	·972 730	·173 447	·027 270	·873 211	961 731	3
4	·799 283	·972 228	·200 717	·027 772	·834 942	960 751	4

H^M.

$4\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·924 949	023 002	4·018 465	987 247	$\bar{5}$·981 535	012 753	10
1	·947 951	023 120	·005 712	989 848	·994 288	010 152	1
2	·971 071	023 260	3·995 560	991 778	$\bar{4}$·004 440	008 222	2
3	·994 331	023 418	·987 338	992 990	·012 662	007 010	3
4	$\bar{6}$·017 749	023 591	·980 328	993 566	·019 672	006 434	4
15	·041 340	023 772	·973 894	993 520	·026 106	006 480	15
6	·065 112	023 956	·967 414	992 899	·032 586	007 101	6
7	·089 068	024 134	·960 313	991 756	·039 687	008 244	7
8	·113 202	024 302	·952 069	990 095	·047 931	009 905	8
9	·137 504	024 458	·942 164	988 408	·057 836	011 592	9
20	·161 962	024 608	·930 572	987 509	·069 428	012 491	20
1	·186 570	024 757	·918 081	987 003	·081 919	012 997	1
2	·211 327	024 914	·905 084	987 046	·094 916	012 954	2
3	·236 241	025 083	·892 130	987 471	·107 870	012 529	3
4	·261 324	025 266	·879 601	987 975	·120 399	012 025	4
25	·286 590	025 463	·867 576	988 270	·132 424	011 730	25
6	·312 053	025 670	·855 846	988 450	·144 154	011 550	6
7	·337 723	025 888	·844 296	988 356	·155 704	011 644	7
8	·363 611	026 112	·832 652	988 190	·167 348	011 810	8
9	·389 723	026 346	·820 842	988 048	·179 158	011 952	9
30	·416 069	026 589	·808 890	987 875	·191 110	012 125	30
1	·442 658	026 844	·796 765	987 862	·203 235	012 138	1
2	·469 502	027 112	·784 627	987 869	·215 373	012 131	2
3	·496 614	027 397	·772 496	987 897	·227 504	012 103	3
4	·524 011	027 696	·760 393	987 877	·239 607	012 123	4
35	·551 707	028 010	·748 270	987 796	·251 730	012 204	35
6	·579 717	028 340	·736 066	987 637	·263 934	012 363	6
7	·608 057	028 687	·723 703	987 466	·276 297	012 534	7
8	·636 744	029 050	·711 169	987 360	·288 831	012 640	8
9	·665 794	029 436	·698 529	987 289	·301 471	012 711	9
40	·695 230	029 847	·685 818	987 326	·314 182	012 674	40
1	·725 077	030 288	·673 144	987 426	·326 856	012 574	1
2	·755 365	030 760	·660 570	987 454	·339 430	012 546	2
3	·786 125	031 262	·648 024	987 327	·351 976	012 673	3
4	·817 387	031 797	·635 351	987 173	·364 649	012 827	4
45	·849 184	032 361	·622 524	986 811	·377 476	013 189	45
6	·881 545	032 953	·609 335	986 353	·390 665	013 647	6
7	·914 498	033 577	·595 688	985 907	·404 312	014 093	7
8	·948 075	034 239	·581 595	985 514	·418 405	014 486	8
9	·982 314	034 940	·567 109	985 105	·432 891	014 895	9
50	$\bar{5}$·017 254	035 690	·552 214	984 770	·447 786	015 230	50
1	·052 944	036 492	·536 984	984 472	·463 016	015 528	1
2	·089 436	037 353	·521 456	984 049	·478 544	015 951	2
3	·126 789	038 269	·505 505	983 501	·494 495	016 499	3
4	·165 058	039 249	·489 006	982 912	·510 994	017 088	4

Hᴹ.

4½ PER CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·771 511	$\bar{1}$·971 651	$\bar{4}$·228 489	0·028 349	4·795 693	959 706	55
6	·743 162	·971 022	·256 838	·028 978	·755 399	958 589	6
7	·714 184	·970 338	·285 816	·029 662	·713 988	957 397	7
8	·684 522	·969 609	·315 478	·030 391	·671 385	956 118	8
9	·654 131	·968 756	·345 869	·031 244	·627 503	954 752	9
60	·622 887	·967 800	·377 113	·032 200	·582 255	953 295	60
1	·590 687	·966 742	·409 313	·033 258	·535 550	951 743	1
2	·557 429	·965 575	·442 571	·034 425	·487 293	950 087	2
3	·523 004	·964 288	·476 996	·035 712	·437 380	948 325	3
4	·487 292	·962 970	·512 708	·037 030	·385 705	946 439	4
65	·450 262	·961 600	·549 738	·038 400	·332 144	944 410	65
6	·411 862	·960 173	·588 138	·039 827	·276 554	942 212	6
7	·372 035	·958 658	·627 965	·041 342	·218 766	939 819	7
8	·330 693	·957 126	·669 307	·042 874	·158 585	937 188	8
9	·287 819	·955 239	·712 181	·044 761	·095 773	934 310	9
70	·243 058	·952 998	·756 942	·047 002	·030 083	931 180	70
1	·196 056	·950 276	·803 944	·049 724	3·961 263	927 815	1
2	·146 332	·947 054	·853 668	·052 946	·889 078	924 243	2
3	·093 386	·943 319	·906 614	·056 681	·813 321	920 511	3
4	·036 705	·939 354	·963 295	·060 646	·733 832	916 626	4
75	2·976 059	·935 917	$\bar{3}$·023 941	·064 083	·650 458	912 431	75
6	·911 976	·932 040	·088 024	·067 960	·562 889	907 927	6
7	·844 016	·927 981	·155 984	·072 019	·470 816	903 052	7
8	·771 997	·923 778	·228 003	·076 222	·373 868	897 710	8
9	·695 775	·918 873	·304 225	·081 127	·271 578	891 912	9
80	·614 648	·913 027	·385 352	·086 973	·163 490	885 754	80
1	·527 675	·906 177	·472 325	·093 823	·049 244	879 416	1
2	·433 852	·899 254	·566 148	·100 746	2·928 660	872 871	2
3	·333 106	·891 586	·666 894	·108 414	·801 531	866 318	3
4	·224 692	·884 583	·775 308	·115 417	·667 849	859 541	4
85	·109 275	·878 574	·890 725	·121 426	·527 390	852 048	85
6	1·987 849	·873 170	$\bar{2}$·012 151	·126 830	·379 438	843 173	6
7	·861 019	·866 681	·138 981	·133 319	·222 611	832 538	7
8	·727 700	·862 097	·272 300	·137 903	·055 149	817 903	8
9	·589 797	·854 090	·410 203	·145 910	1·873 052	797 786	9
90	·443 887	·838 546	·556 113	·161 454	·670 838	771 676	90
1	·282 433	·818 007	·717 567	·181 993	·442 514	736 468	1
2	·100 440	·792 918	·899 560	·207 082	·178 982	682 998	2
3	0·893 358	·747 461	$\bar{1}$·106 642	·252 539	0·861 980	601 027	3
4	·640 819	·673 467	·359 181	·326 533	·463 007	462 345	4
95	·314 286	·540 746	·685 714	·459 254	$\bar{1}$·925 352	174 610	95
6	$\bar{1}$·855 032	·244 930	0·144 968	·755 070	·099 962		6
7	·099 962		·900 038				7

Hm.

4½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·204 307	040 294	3·471 918	982 216	$\bar{4}$·528 082	017 784	55
6	·244 601	041 411	·454 134	981 456	·545 866	018 544	6
7	·286 012	042 603	·435 590	980 638	·564 410	019 362	7
8	·328 615	043 882	·416 228	979 784	·583 772	020 216	8
9	·372 497	045 248	·396 012	978 752	·603 988	021 248	9
60	·417 745	046 705	·374 764	977 594	·625 236	022 406	60
1	·464 450	048 257	·352 358	976 316	·647 642	023 684	1
2	·512 707	049 913	·328 674	974 913	·671 326	025 087	2
3	·562 620	051 675	·303 587	973 378	·696 413	026 622	3
4	·614 295	053 561	·276 965	971 850	·723 035	028 150	4
65	·667 856	055 590	·248 815	970 305	·751 185	029 695	65
6	·723 446	057 788	·219 120	968 736	·780 880	031 264	6
7	·781 234	060 181	·187 856	967 100	·812 144	032 900	7
8	·841 415	062 812	·154 956	965 508	·845 044	034 492	8
9	·904 227	065 690	·120 464	963 472	·879 536	036 528	9
70	·969 917	068 820	·083 936	961 018	·916 064	038 982	70
1	$\bar{4}$·038 737	072 185	·044 954	957 982	·955 046	042 018	1
2	·110 922	075 757	·002 936	954 354	·997 064	045 646	2
3	·186 679	079 489	2·957 290	950 134	$\bar{3}$·042 710	049 866	3
4	·266 168	083 374	·907 424	945 701	·092 576	054 299	4
75	·349 542	087 569	·853 125	942 047	·146 875	057 953	75
6	·437 111	092 073	·795 172	937 917	·204 828	062 083	6
7	·529 184	096 948	·733 089	933 647	·266 911	066 353	7
8	·626 132	102 290	·666 736	929 294	·333 264	070 706	8
9	·728 422	108 088	·596 030	924 173	·403 970	075 827	9
80	·836 510	114 246	·520 203	918 005	·479 797	081 995	80
1	·950 756	120 584	·438 208	910 717	·561 792	089 283	1
2	$\bar{3}$·071 340	127 129	·348 925	903 422	·651 075	096 578	2
3	·198 469	133 682	·252 347	895 314	·747 653	104 686	3
4	·332 151	140 459	·147 661	888 040	·852 339	111 960	4
85	·472 610	147 952	·035 701	881 998	·964 299	118 002	85
6	·620 562	156 827	1·917 699	876 770	$\bar{2}$·082 301	123 230	6
7	·777 389	167 462	·794 469	870 453	·205 531	129 547	7
8	·944 851	182 097	·664 922	866 519	·335 078	133 481	8
9	$\bar{2}$·126 948	202 214	·531 441	859 054	·468 559	140 946	9
90	·329 162	228 324	·390 495	843 607	·609 505	156 393	90
1	·557 486	263 532	·234 102	823 148	·765 898	176 852	1
2	·821 018	317 002	·057 250	798 417	·942 750	201 583	2
3	$\bar{1}$·138 020	398 973	0·855 667	752 858	$\bar{1}$·144 333	247 142	3
4	·536 993	537 655	·608 525	678 584	·391 475	321 416	4
95	0·074 648	825 390	·287 109	545 342	·712 891	454 658	95
6	·900 038		$\bar{1}$·832 451	248 395	0·167 549	751 605	6
7			·080 846		·919 154		7

H^M.

$4\frac{1}{2}$ PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	18·4592	·162 042	·008 327	55	10·5726	·501 658	·043 349
1	18·3849	·165 243	·008 524	6	10·2858	·514 010	·045 545
2	18·2892	·169 366	·008 780	7	9·9955	·526 509	·047 884
3	18·1758	·174 246	·009 087	8	9·7020	·539 146	·050 378
4	18·0493	·179 695	·009 433	9	9·4053	·551 926	·053 043
15	17·9137	·185 533	·009 809	60	9·1068	·564 777	·055 881
6	17·7738	·191 561	·010 204	1	8·8077	·577 658	·058 898
7	17·6341	·197 575	·010 603	2	8·5087	·590 534	·062 105
8	17·4994	·203 374	·010 994	3	8·2106	·603 370	·065 508
9	17·3750	·208 734	·011 360	4	7·9143	·616 130	·069 117
20	17·2617	·213 609	·011 697	65	7·6187	·628 859	·072 964
1	17·1534	·218 274	·012 024	6	7·3230	·641 591	·077 086
2	17·0467	·222 870	·012 350	7	7·0264	·654 367	·081 527
3	16·9366	·227 613	·012 690	8	6·7281	·667 211	·086 336
4	16·8192	·232 665	·013 057	9	6·4262	·680 212	·091 596
25	16·6936	·238 076	·013 456	70	6·1238	·693 231	·097 311
6	16·5612	·243 776	·013 881	1	5·8238	·706 151	·103 484
7	16·4229	·249 730	·014 333	2	5·5303	·718 792	·110 071
8	16·2813	·255 830	·014 804	3	5·2473	·730 978	·117 007
9	16·1368	·262 050	·015 292	4	4·9788	·742 538	·124 195
30	15·9893	·268 404	·015 798	75	4·7250	·753 470	·131 611
1	15·8388	·274 882	·016 324	6	4·4762	·764 181	·139 545
2	15·6837	·281 564	·016 877	7	4·2345	·774 592	·147 979
3	15·5234	·288 467	·017 458	8	3·9983	·784 764	·157 007
4	15·3575	·295 612	·018 072	9	3·7653	·794 794	·166 787
35	15·1862	·302 988	·018 719	80	3·5387	·804 554	·177 266
6	15·0100	·310 573	·019 399	1	3·3233	·813 829	·188 243
7	14·8297	·318 340	·020 110	2	3·1247	·822 381	·199 380
8	14·6450	·326 290	·020 856	3	2·9405	·830 312	·210 711
9	14·4552	·334 463	·021 641	4	2·7743	·837 469	·221 886
40	14·2596	·342 890	·022 470	85	2·6189	·844 163	·233 266
1	14·0564	·351 638	·023 355	6	2·4637	·850 844	·245 645
2	13·8446	·360 758	·024 302	7	2·2993	·857 925	·260 034
3	13·6246	·370 232	·025 316	8	2·1254	·865 411	·276 892
4	13·3979	·379 993	·026 392	9	1·9198	·874 266	·299 427
45	13·1645	·390 044	·027 537	90	1·6864	·884 318	·329 188
6	12·9267	·400 284	·028 742	1	1·4457	·894 681	·365 817
7	12·6855	·410 671	·030 008	2	1·1982	·905 337	·411 847
8	12·4405	·421 221	·031 340	3	·9303	·916 874	·474 991
9	12·1908	·431 973	·032 748	4	·6640	·928 337	·557 885
50	11·9363	·442 934	·034 240	95	·4084	·939 340	·666 964
1	11·6756	·454 159	·035 829	6	·1758	·949 333	·807 418
2	11·4079	·465 690	·037 532	7		·956 938	·956 938
3	11·1342	·477 476	.039 350				
4	10·8557	·489 466	·041 285				

H^{M}.

FIVE PER-CENT.

Hm.

5 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	61 391·3	1 047 140·2	16 859 782	8 604·11	252 897·6	10
1	58 181·4	988 958·8	15 812 642	8 317·61	244 293·5	1
2	55 189·8	933 769·0	14 823 683	8 096·55	235 975·9	2
3	52 387·3	881 381·7	13 889 914	7 922·07	227 879·3	3
4	49 747·2	831 634·5	13 008 533	7 776·61	219 957·3	4
15	47 247·4	784 387·1	12 176 898	7 645·78	212 180·6	15
6	44 868·4	739 518·8	11 392 511	7 516·59	204 534·9	6
7	42 593·0	696 925·7	10 652 992	7 377·85	197 018·3	7
8	40 407·3	656 518·4	9 956 066	7 220·36	189 640·4	8
9	38 298·7	618 219·7	9 299 548	7 035·95	182 420·1	9
20	36 265·4	581 954·3	8 681 328	6 826·40	175 384·1	20
1	34 319·9	547 634·4	8 099 374	6 607·81	168 557·7	1
2	32 465·8	515 168·5	7 551 740	6 388·00	161 949·9	2
3	30 708·2	484 460·3	7 036 571	6 176·38	155 561·9	3
4	29 048·1	455 412·2	6 552 111	5 978·55	149 385·5	4
25	27 481·2	427 931·1	6 096 699	5 794·87	143 407·0	25
6	25 999·0	401 932·1	5 668 768	5 621·35	137 612·1	6
7	24 595·4	377 336·6	5 266 835	5 455·82	131 990·8	7
8	23 262·5	354 074·1	4 889 499	5 294·09	126 534·9	8
9	21 995·9	332 078·2	4 535 425	5 135·20	121 240·9	9
30	20 792·7	311 285·5	4 203 347	4 979·48	116 105·7	30
1	19 649·7	291 635·8	3 892 061	4 826·55	111 126·2	1
2	18 565·8	273 070·0	3 600 425	4 678·39	106 299·6	2
3	17 538·4	255 531·6	3 327 355	4 535·08	101 621·2	3
4	16 564·9	238 966·8	3 071 824	4 396·69	97 086·14	4
35	15 641·9	223 324·8	2 832 857	4 262·54	92 689·45	35
6	14 766·4	208 558·5	2 609 532	4 131·84	88 426·91	6
7	13 935·1	194 623·4	2 400 973	4 003·74	84 295·07	7
8	13 145·9	181 477·5	2 206 350	3 878·14	80 291·33	8
9	12 397·5	169 080·0	2 024 873	3 755·69	76 413·19	9
40	11 688·1	157 391·9	1 855 793	3 636·66	72 657·50	40
1	11 016·8	146 375·1	1 698 401	3 521·94	69 020·84	1
2	10 382·2	135 993·0	1 552 026	3 411·91	65 498·90	2
3	9 781·63	126 211·3	1 416 033	3 305·77	62 086·99	3
4	9 212·18	116 999·2	1 289 821	3 202·12	58 781·22	4
45	8 672·11	108 327·0	1 172 822	3 100·72	55 579·10	45
6	8 158·46	100 168·6	1 064 495	3 000·03	52 478·38	6
7	7 669·41	92 499·17	964 326·5	2 899·48	49 478·35	7
8	7 204·12	85 295·05	871 827·3	2 799·40	46 578·87	8
9	6 761·99	78 533·06	786 532·3	2 700·33	43 779·47	9
50	6 341·98	72 191·08	707 999·2	2 602·31	41 079·14	50
1	5 943·64	66 247·44	635 808·2	2 505·97	38 476·83	1
2	5 566·25	60 681·19	569 560·7	2 411·61	35 970·86	2
3	5 208·16	55 473·04	508 879·5	2 318·58	33 559·25	3
4	4 867·89	50 605·15	453 406·5	2 226·31	31 240·68	4

H^M.

5 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	4 544·59	46 060·56	402 801·3	2 134·83	29 014·36	55
6	4 237·15	41 823·41	356 740·8	2 043·79	26 879·54	6
7	3 944·77	37 878·63	314 917·4	1 953·18	24 835·75	7
8	3 666·80	34 211·84	277 038·7	1 863·05	22 882·57	8
9	3 402·70	30 809·14	242 826·9	1 773·56	21 019·51	9
60	3 151·42	27 657·71	212 017·8	1 684·32	19 245·95	60
1	2 912·28	24 745·43	184 360·1	1 595·25	17 561·63	1
2	2 684·74	22 060·69	159 614·6	1 506·39	15 966·38	2
3	2 468·34	19 592·36	137 553·9	1 417·83	14 459·99	3
4	2 262·66	17 329·69	117 961·6	1 329·69	13 042·17	4
65	2 067·84	15 261·86	100 631·9	1 242·61	11 712·48	65
6	1 883·84	13 378·02	85 370·02	1 157·08	10 469·86	6
7	1 710·58	11 667·44	71 992·00	1 073·53	9 312·781	7
8	1 547·85	10 119·59	60 324·56	992·256	8 239·250	8
9	1 395·67	8 723·926	50 204·97	913·781	7 246·994	9
70	1 252·99	7 470·936	41 481·04	837·565	6 333·213	70
1	1 119·11	6 351·827	34 010·11	763·350	5 495·648	1
2	993·289	5 358·538	27 658·28	690·821	4 732·298	2
3	875·097	4 483·441	22 299·74	619·928	4 041·477	3
4	764·368	3 719·074	17 816·30	550·871	3 421·549	4
75	661·582	3 057·492	14 097·23	484·483	2 870·678	75
6	568·103	2 489·389	11 039·74	422·508	2 386·195	6
7	483·498	2 005·891	8 550·347	364·955	1 963·687	7
8	407·664	1 598·227	6 544·455	312·145	1 598·732	8
9	340·414	1 257·813	4 946·228	264·308	1 286·587	9
80	281·065	976·748 1	3 688·415	221·169	1 022·279	80
1	228·961	747·787 5	2 711·667	182·449	801·109 4	1
2	183·597	564·190 7	1 963·879	147·988	618·660 5	2
3	144·893	419·298 2	1 399·688	118·026	470·672 7	3
4	112·346	306·951 8	980·390 1	92·379 9	352·646 4	4
85	85·717 4	221·234 4	673·438 3	71·100 7	260·266 5	85
6	64·501 5	156·732 9	452·204 0	53·966 5	189·165 9	6
7	47·936 6	108·796 2	295·471 1	40·473 2	135·199 3	7
8	35·097 4	73·698 9	186·674 9	29·916 6	94·726 2	8
9	25·427 2	48·271 6	112·976 0	21·917 8	64·809 6	9
90	18·084 9	30·186 7	64·704 4	15·786 2	42·891 8	90
1	12·410 5	17·776 2	34·517 7	10·973 0	27·105 5	1
2	8·123 1	9·653 1	16·741 5	7·276 6	16·132 5	2
3	5·018 4	4·634 7	7·088 4	4·558 8	8·855 9	3
4	2·792 3	1·842 4	2·453 8	2·571 6	4·297 1	4
95	1·310 2	·532 2	·611 4	1·222 5	1·725 5	95
6	·452 9	·079 2	·079 2	·427 6	·503 0	6
7	·079 2	·000 0	·000 0	·075 5	·075 5	7

Hm.

5 PER CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·788 107	1·976 677	5·211 893	0·023 323	6·020 005	975 173	10
1	·764 784	·977 075	·235 216	·022 925	5·995 178	975 061	1
2	·741 859	·977 367	·258 141	·022 633	·970 239	974 925	2
3	·719 226	·977 542	·280 774	·022 458	·945 164	974 769	3
4	·696 768	·977 610	·303 232	·022 390	·919 933	974 598	4
15	·674 378	·977 562	·325 622	·022 438	·894 531	974 418	15
6	·651 940	·977 399	·348 060	·022 601	·868 949	974 238	6
7	·629 339	·977 121	·370 661	·022 879	·843 187	974 060	7
8	·606 460	·976 724	·393 540	·023 276	·817 247	973 896	8
9	·583 184	·976 309	·416 816	·023 691	·791 143	973 746	9
20	·559 493	·976 053	·440 507	·023 947	·764 889	973 602	20
1	·535 546	·975 880	·464 454	·024 120	·738 491	973 458	1
2	·511 426	·975 829	·488 574	·024 171	·711 949	973 309	2
3	·487 255	·975 863	·512 745	·024 137	·685 258	973 147	3
4	·463 118	·975 917	·536 882	·024 083	·658 405	972 969	4
25	·439 035	·975 922	·560 965	·024 078	·631 374	972 779	25
6	·414 957	·975 898	·585 043	·024 102	·604 153	972 576	6
7	·390 855	·975 801	·609 145	·024 199	·576 729	972 365	7
8	·366 656	·975 685	·633 344	·024 315	·549 094	972 146	8
9	·342 341	·975 571	·657 659	·024 429	·521 240	971 919	9
30	·317 912	·975 443	·682 088	·024 557	·493 159	971 682	30
1	·293 355	·975 359	·706 645	·024 641	·464 841	971 433	1
2	·268 714	·975 276	·731 286	·024 724	·436 274	971 171	2
3	·243 990	·975 198	·756 010	·024 802	·407 445	970 893	3
4	·219 188	·975 102	·780 812	·024 898	·378 338	970 599	4
35	·194 290	·974 983	·805 710	·025 017	·348 937	970 291	35
6	·169 273	·974 837	·830 727	·025 163	·319 228	969 967	6
7	·144 110	·974 681	·855 890	·025 319	·289 195	969 628	7
8	·118 791	·974 542	·881 209	·025 458	·258 823	969 269	8
9	·093 333	·974 410	·906 667	·025 590	·228 092	968 890	9
40	·067 743	·974 312	·932 257	·025 688	·196 982	968 485	40
1	·042 055	·974 232	·957 945	·025 768	·165 467	968 050	1
2	·016 287	·974 124	·983 713	·025 876	·133 517	967 581	2
3	3·990 411	·973 951	$\bar{4}$·009 589	·026 049	·101 098	967 085	3
4	·964 362	·973 763	·035 638	·026 237	·068 183	966 554	4
45	·938 125	·973 483	·061 875	·026 517	·034 737	965 995	45
6	·911 608	·973 154	·088 392	·026 846	·000 732	965 406	6
7	·884 762	·972 819	·115 238	·027 181	4·966 138	964 786	7
8	·857 581	·972 494	·142 419	·027 506	·930 924	964 129	8
9	·830 075	·972 150	·169 925	·027 850	·895 053	963 431	9
50	·802 225	·971 827	·197 775	·028 173	·858 484	962 685	50
1	·774 052	·971 511	·225 948	·028 489	·821 169	961 885	1
2	·745 563	·971 121	·254 437	·028 879	·783 054	961 028	2
3	·716 684	·970 657	·283 316	·029 343	·744 082	960 113	3
4	·687 341	·970 154	·312 659	·029 846	·704 195	959 134	4

Hm.

5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·979 995	024 827	3·934 706	985 293	$\bar{4}$·065 294	014 707	10
1	6·004 822	024 939	·919 999	988 301	·080 001	011 699	1
2	·029 761	025 075	·908 300	990 539	·091 700	009 461	2
3	·054 836	025 231	·898 839	991 952	·101 161	008 048	3
4	·080 067	025 402	·890 791	992 631	·109 209	007 369	4
15	·105 469	025 582	·883 422	992 599	·116 578	007 401	15
6	·131 051	025 762	·876 021	991 909	·123 979	008 091	6
7	·156 813	025 940	·867 930	990 629	·132 070	009 371	7
8	·182 753	026 104	·858 559	988 764	·141 441	011 236	8
9	·208 857	026 254	·847 323	986 869	·152 677	013 131	9
20	·235 111	026 398	·834 192	985 865	·165 808	014 135	20
1	·261 509	026 542	·820 057	985 308	·179 943	014 692	1
2	·288 051	026 691	·805 365	985 369	·194 635	014 631	2
3	·314 742	026 853	·790 734	985 862	·209 266	014 138	3
4	·341 595	027 031	·776 596	986 448	·223 404	013 552	4
25	·368 626	027 221	·763 044	986 797	·236 956	013 203	25
6	·395 847	027 424	·749 841	987 019	·250 159	012 981	6
7	·423 271	027 635	·736 860	986 931	·263 140	013 069	7
8	·450 906	027 854	·723 791	986 767	·276 209	013 233	8
9	·478 760	028 081	·710 558	986 626	·289 442	013 374	9
30	·506 841	028 318	·697 184	986 453	·302 816	013 547	30
1	·535 159	028 567	·683 637	986 459	·316 363	013 541	1
2	·563 726	028 829	·670 096	986 489	·329 904	013 511	2
3	·592 555	029 107	·656 585	986 541	·343 415	013 459	3
4	·621 662	029 401	·643 126	986 542	·356 874	013 458	4
35	·651 063	029 709	·629 668	986 475	·370 332	013 525	35
6	·681 772	030 033	·616 143	986 323	·383 857	013 677	6
7	·710 805	030 372	·602 466	986 158	·397 534	013 842	7
8	·741 177	030 731	·588 624	986 066	·411 376	013 934	8
9	·771 908	031 110	·574 690	986 013	·425 310	013 987	9
40	·803 018	031 515	·560 703	986 079	·439 297	013 921	40
1	·834 533	031 950	·546 782	986 216	·453 218	013 784	1
2	·866 483	032 419	·532 998	986 275	·467 002	013 725	2
3	·898 902	032 915	·519 273	986 164	·480 727	013 836	3
4	·931 817	033 446	·505 437	986 026	·494 563	013 974	4
45	·965 263	034 005	·491 463	985 662	·508 537	014 338	45
6	·999 268	034 594	·477 125	985 195	·522 875	014 805	6
7	$\bar{5}$·033 862	035 214	·462 320	984 745	·537 680	015 255	7
8	·069 076	035 871	·447 065	984 351	·552 935	015 649	8
9	·104 947	036 569	·431 416	983 943	·568 584	016 057	9
50	·141 516	037 315	·415 359	983 617	·584 641	016 383	50
1	·178 831	038 115	·398 976	983 331	·601 024	016 669	1
2	·216 946	038 972	·382 307	982 914	·617 693	017 086	2
3	·255 918	039 887	·365 221	982 366	·634 779	017 634	3
4	·295 805	040 866	·347 587	981 775	·652 413	018 225	4

H^{M}.

5 PER CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·657 495	1·969 579	4·342 505	0·030 421	4·663 329	958 091	55
6	·627 074	·968 948	·372 926	·031 052	·621 420	956 974	6
7	·596 022	·968 265	·403 978	·031 735	·578 394	955 783	7
8	·564 287	·967 537	·435 713	·032 463	·534 177	954 503	8
9	·531 824	·966 683	·468 176	·033 317	·488 680	953 136	9
60	·498 507	·965 726	·501 493	·034 274	·441 816	951 679	60
1	·464 233	·964 669	·535 767	·035 331	·393 495	950 124	1
2	·428 902	·963 502	·571 098	·036 498	·343 619	948 468	2
3	·392 404	·962 216	·607 596	·037 784	·292 087	946 704	3
4	·354 620	·960 896	·645 380	·039 104	·238 791	944 816	4
65	·315 516	·959 527	·684 484	·040 473	·183 607	942 785	65
6	·275 043	·958 100	·724 957	·041 900	·126 392	940 584	6
7	·233 143	·956 585	·766 857	·043 415	·066 976	938 187	7
8	·189 728	·955 054	·810 272	·044 946	·005 163	935 549	8
9	·144 782	·953 166	·855 218	·046 834	3·940 712	932 663	9
70	·097 948	·950 924	·902 052	·049 076	·873 375	929 524	70
1	·048 872	·948 204	·951 128	·051 796	·802 899	926 147	1
2	2·997 076	·944 980	$\bar{3}$·002 924	·055 020	·729 046	922 566	2
3	·942 056	·941 246	·057 944	·058 754	·651 612	918 823	3
4	·883 302	·937 282	·116 698	·062 718	·570 435	914 930	4
75	·820 584	·933 843	·179 416	·066 157	·485 365	910 728	75
6	·754 427	·929 967	·245 573	·070 033	·396 093	906 214	6
7	·684 394	·925 908	·315 606	·074 092	·302 307	901 331	7
8	·610 302	·921 705	·389 698	·078 295	·203 638	895 978	8
9	·532 007	·916 800	·467 993	·083 200	·099 616	890 167	9
80	·448 807	·910 954	·551 193	·089 046	2·989 783	883 995	80
1	·359 761	·904 104	·640 239	·095 896	·873 778	877 648	1
2	·263 865	·897 181	·736 135	·102 819	·751 426	871 097	2
3	·161 046	·889 513	·838 954	·110 487	·622 523	864 547	3
4	·050 559	·882 510	·949 441	·117 490	·487 070	857 783	4
85	1·933 069	·876 501	2·066 931	·123 499	·344 853	850 307	85
6	·809 570	·871 097	·190 430	·128 903	·195 160	841 454	6
7	·680 667	·864 608	·319 333	·135 392	·036 614	830 847	7
8	·545 275	·860 024	·454 725	·139 976	1·867 461	816 231	8
9	·405 299	·852 017	·594 701	·147 983	·683 692	796 124	9
90	·257 316	·836 474	·742 684	·163 526	·479 816	770 023	90
1	·093 790	·815 933	·906 210	·184 067	·249 839	734 827	1
2	0·909 723	·790 845	$\bar{1}$·090 277	·209 155	0·984 666	681 351	2
3	·700 568	·745 389	·299 432	·254 611	·666 017	599 364	3
4	·445 957	·671 393	·554 043	·328 607	·265 381	460 653	4
95	·117 350	·538 673	·882 650	·461 327	$\bar{1}$·726 034	172 847	95
6	$\bar{1}$·656 023	·242 858	0·343 977	·757 142	2·898 881		6
7	$\bar{2}$·898 881		1·101 119				7

Hm.

5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·336 671	041 909	3·329 362	981 074	$\bar{4}$·670 638	018 926	55
6	·378 580	043 026	·310 436	980 307	·689 564	019 693	6
7	·421 606	044 217	·290 743	979 483	·709 257	020 517	7
8	·465 823	045 497	·270 226	978 621	·729 774	021 379	8
9	·511 320	046 864	·248 847	977 578	·751 153	022 422	9
60	·558 184	048 321	·226 425	976 403	·773 575	023 597	60
1	·606 505	049 876	·202 828	975 108	·797 172	024 892	1
2	·656 381	051 532	·177 936	973 687	·822 064	026 313	2
3	·707 913	053 296	·151 623	972 128	·848 377	027 872	3
4	·761 209	055 184	·123 751	970 585	·876 249	029 415	4
65	·816 393	057 215	·094 336	969 028	·905 664	030 972	65
6	·873 608	059 416	·063 364	967 451	·936 636	032 549	6
7	·933 024	061 813	·030 815	965 809	·969 185	034 191	7
8	·994 837	064 451	2·996 624	964 218	$\bar{3}$·003 376	035 782	8
9	$\bar{4}$·059 288	067 337	·960 842	962 176	·039 158	037 824	9
70	·126 625	070 476	·923 018	959 706	·076 982	040 294	70
1	·197 101	073 853	·882 724	956 641	·117 276	043 359	1
2	·270 954	077 434	·839 365	952 976	·160 635	047 024	2
3	·348 388	081 177	·792 341	948 709	·207 659	051 291	3
4	·429 565	085 070	·741 050	944 229	·258 950	055 771	4
75	·514 635	089 272	·685 279	940 556	·314 721	059 444	75
6	·603 907	093 786	·625 835	936 405	·374 165	063 595	6
7	·697 693	098 669	·562 240	932 117	·437 760	067 883	7
8	·796 362	104 022	·494 357	927 753	·505 643	072 247	8
9	·900 384	109 833	·422 110	922 615	·577 890	077 385	9
80	$\bar{3}$·010 217	116 005	·344 725	916 416	·655 275	083 584	80
1	·126 222	122 352	·261 141	909 085	·738 859	090 915	1
2	·248 574	128 903	·170 226	901 753	·829 774	098 247	2
3	·377 477	135 453	·071 979	893 598	·928 021	106 402	3
4	·512 930	142 217	1·965 577	886 297	$\bar{2}$·034 423	113 703	4
85	·655 147	149 693	·851 874	880 250	·148 126	119 750	85
6	·804 840	158 546	·732 124	875 043	·267 876	124 957	6
7	·963 386	169 153	·607 167	868 746	·392 833	131 254	7
8	$\bar{2}$·132 539	183 769	·475 913	864 883	·524 087	135 117	8
9	·316 308	203 876	·340 796	857 483	·659 204	142 517	9
90	·520 184	229 977	·198 279	842 048	·801 721	157 952	90
1	·750 161	265 173	·040 327	821 603	·959 673	178 397	1
2	$\bar{1}$·015 334	318 649	0·861 930	796 917	$\bar{1}$·138 070	203 083	2
3	·333 983	400 636	·658 847	751 351	·341 153	248 649	3
4	·734 619	539 347	·410 198	677 053	·589 802	322 947	4
95	0·273 966	827 153	·087 251	543 768	·912 749	456 232	95
6	1·101 119		$\bar{1}$·631 019	246 672	0·368 981	753 328	6
7			$\bar{2}$·877 691		1·122 309		7

Hm.

5 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	17·056 8	·140 152	·007 762	55	10·135 2	·469 751	·042 186
1	16·997 8	·142 960	·007 943	6	9·870 7	·482 350	·044 372
2	16·919 2	·146 704	·008 187	7	9·602 2	·495 132	·046 701
3	16·824 3	·151 221	·008 484	8	9·330 2	·508 088	·049 185
4	16·717 2	·156 323	·008 823	9	9·054 3	·521 223	·051 841
15	16·601 7	·161 824	·009 194	60	8·776 3	·534 464	·054 670
6	16·482 0	·167 525	·009 583	1	8·496 9	·547 766	·057 678
7	16·362 4	·173 217	·009 977	2	8·217 1	·561 092	·060 875
8	16·247 5	·178 690	·010 360	3	7·937 5	·574 406	·064 269
9	16·142 0	·183 713	·010 717	4	7·659 0	·587 667	·067 868
20	16·047 1	·188 234	·011 042	65	7·380 6	·600 924	·071 704
1	15·956 8	·192 536	·011 355	6	7·101 5	·614 215	·075 815
2	15·868 0	·196 761	·011 665	7	6·820 8	·627 583	·080 246
3	15·776 2	·201 131	·011 989	8	6·537 8	·641 055	·085 045
4	15·677 9	·205 816	·012 341	9	6·250 7	·654 727	·090 298
25	15·571 8	·210 867	·012 724	70	5·962 5	·668 453	·096 008
6	15·459 5	·216 214	·013 136	1	5·675 8	·682 105	·102 176
7	15·341 7	·221 822	·013 574	2	5·394 7	·695 488	·108 759
8	15·220 8	·227 580	·014 030	3	5·123 4	·708 411	·115 690
9	15·097 3	·233 462	·014 503	4	4·865 6	·720 688	·122 868
30	14·970 9	·239 482	·014 995	75	4·621 5	·732 310	·130 270
1	14·841 8	·245 630	·015 505	6	4·381 9	·743 717	·138 188
2	14·708 2	·251 989	·016 042	7	4·148 7	·754 824	·146 604
3	14·569 8	·258 580	·016 608	8	3·920 5	·765 693	·155 614
4	14·426 1	·265 423	·017 206	9	3·695 0	·776 431	·165 376
35	14·277 3	·272 508	·017 837	80	3·475 2	·786 897	·175 836
6	14·123 9	·279 814	·018 501	1	3·266 0	·796 857	·186 792
7	13·966 4	·287 313	·019 197	2	3·073 0	·806 048	·197 901
8	13·804 9	·295 007	·019 926	3	2·893 9	·814 578	·209 196
9	13·638 3	·302 940	·020 695	4	2·732 2	·822 277	·220 320
40	13·466 0	·311 142	·021 509	85	2·581 0	·829 478	·231 635
1	13·286 5	·319 688	·022 377	6	2·429 9	·836 671	·243 934
2	13·098 7	·328 632	·023 309	7	2·269 6	·844 305	·258 230
3	12·902 9	·337 957	·024 308	8	2·099 8	·852 389	·274 979
4	12·700 5	·347 596	·025 371	9	1·898 4	·861 980	·297 396
45	12·491 4	·357 551	·026 502	90	1·669 2	·872 897	·327 030
6	12·277 9	·367 720	·027 694	1	1·432 4	·884 173	·363 506
7	12·060 8	·378 058	·028 946	2	1·188 3	·895 793	·409 347
8	11·839 8	·388 583	·030 264	3	·923 5	·908 404	·472 260
9	11·613 9	·399 339	·031 659	4	·659 8	·920 961	·554 856
50	11·383 1	·410 331	·033 136	95	·406 1	·933 041	·663 544
1	11·145 9	·421 622	·034 713	6	·174 9	·944 051	·803 498
2	10·901 6	·433 256	·036 403	7		·952 381	·952 381
3	10·651 2	·445 182	·038 209				
4	10·395 7	·457 347	·040 133				

H[M].

SIX PER-CENT.

H^M.

6 PER CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	55 839·5	824 105·6	11 933 387	6 031·27	154 662·1	10
1	52 420·6	771 685·0	11 109 282	5 773·14	148 630·8	1
2	49 256·1	722 428·9	10 337 597	5 575·84	142 857·7	2
3	46 313·8	676 115·1	9 615 168	5 421·59	137 281·9	3
4	43 564·9	632 550·2	8 939 053	5 294·21	131 860·3	4
15	40 985·4	591 564·7	8 306 503	5 180·72	126 566·0	15
6	38 554·5	553 010·2	7 714 938	5 069·71	121 385·3	6
7	36 254·1	516 756·2	7 161 928	4 951·61	116 315·6	7
8	34 069·2	482 687·0	6 645 172	4 818·83	111 364·0	8
9	31 986·7	450 700·3	6 162 485	4 664·81	106 545·2	9
20	30 002·8	420 697·5	5 711 784	4 491·45	101 880·4	20
1	28 125·4	392 572·1	5 291 087	4 312·31	97 388·9	1
2	26 354·9	366 217·2	4 898 515	4 133·87	93 076·60	2
3	24 693·0	341 524·2	4 532 298	3 963·71	88 942·73	3
4	23 137·7	318 386·5	4 190 774	3 806·13	84 979·02	4
25	21 683·1	296 703·4	3 872 387	3 661·21	81 172·89	25
6	20 320·1	276 383·3	3 575 684	3 525·59	77 511·68	6
7	19 041·8	257 341·5	3 299 300	3 397·43	73 986·09	7
8	17 839·9	239 501·6	3 041 959	3 273·40	70 588·66	8
9	16 709·4	222 792·2	2 802 457	3 152·70	67 315·26	9
30	15 646·4	207 145·8	2 579 665	3 035·53	64 162·55	30
1	14 646·8	192 499·0	2 372 519	2 921·53	61 127·03	1
2	13 708·3	178 790·7	2 180 020	2 812·13	58 205·49	2
3	12 827·6	165 963·2	2 001 230	2 707·32	55 393·36	3
4	12 001·2	153 962·0	1 835 266	2 607·06	52 686·04	4
35	11 225·6	142 736·4	1 681 304	2 510·78	50 078·98	35
6	10 497·3	132 239·1	1 538 568	2 417·86	47 568·20	6
7	9 812·89	122 426·2	1 406 329	2 327·66	45 150·34	7
8	9 169·84	113 256·4	1 283 903	2 240·05	42 822·68	8
9	8 566·18	104 690·2	1 170 646	2 155·44	40 582·63	9
40	7 999·83	96 690·35	1 065 956	2 073·97	38 427·18	40
1	7 469·23	89 221·12	969 265·8	1 996·19	36 353·21	1
2	6 972·55	82 248·57	880 044·7	1 922·30	34 357·02	2
3	6 507·27	75 741·30	797 796·2	1 851·69	32 434·72	3
4	6 070·63	69 670·68	722 054·9	1 783·38	30 583·03	4
45	5 660·82	64 009·86	652 384·2	1 717·20	28 799·65	45
6	5 275·29	58 734·57	588 374·3	1 652·09	27 082·45	6
7	4 912·29	53 822·28	529 639·8	1 587·69	25 430·36	7
8	4 570·73	49 251·55	475 817·5	1 524·19	23 842·68	8
9	4 249·75	45 001·81	426 565·9	1 461·92	22 318·49	9
50	3 948·18	41 053·63	381 564·1	1 400·90	20 856·56	50
1	3 665·28	37 388·35	340 510·5	1 341·49	19 455·66	1
2	3 400·17	33 988·17	303 122·1	1 283·85	18 114·17	2
3	3 151·42	30 836·76	269 134·0	1 227·56	16 830·32	3
4	2 917·74	27 919·02	238 297·2	1 172·26	15 602·76	4

H^M.

6 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	2 698·26	25 220·76	210 378·2	1 117·94	14 430·50	55
6	2 491·99	22 728·77	185 157·4	1 064·40	13 312·56	6
7	2 298·15	20 430·62	162 428·7	1 011·61	12 248·16	7
8	2 116·05	18 314·57	141 998·0	959·601	11 236·55	8
9	1 945·12	16 369·45	123 683·5	908·445	10 276·95	9
60	1 784·48	14 584·97	107 314·0	857·911	9 368·502	60
1	1 633·51	12 951·46	92 729 05	807·950	8 510·591	1
2	1 491·68	11 459·78	79 777·59	758·577	7 702·642	2
3	1 358·50	10 101·28	68 317·81	709·835	6 944·065	3
4	1 233·56	8 867·718	58 216·54	661·788	6 334·230	4
65	1 116·71	7 751·011	49 348·82	614·761	5 572·442	65
6	1 007·74	6 743·268	41 597·81	569·007	4 957·681	6
7	906·428	5 836·840	34 854·54	524·734	4 388·675	7
8	812·460	5 024·380	29 017·70	482·073	3 863·941	8
9	725·669	4 298·710	23 993·32	441·270	3 381·868	9
70	645·339	3 653·371	19 694·61	402·016	2 940·598	70
1	570·947	3 082·424	16 041·24	364·153	2 538·582	1
2	501·976	2 580·448	12 958·82	327·499	2 174·429	2
3	438·073	2 142·375	10 378·37	292·010	1 846·931	3
4	379·033	1 763·343	8 235·992	257·766	1 554·920	4
75	324·968	1 438·374	6 472·649	225·157	1 297·155	75
6	276·419	1 161·955	5 034·275	195·002	1 071·998	6
7	233·034	928·922	3 872·320	167·263	876·996 4	7
8	194·630	734·291	2 943·398	142·050	709·733 8	8
9	160·990	573·302	2 209·107	119·426	567·684 1	9
80	131·669	441·633	1 635·805	99·217 5	448·257 9	80
1	106·248	335·386	1 194·172	81·249 5	349·040 5	1
2	84·393 0	250·993	858·786	65·408 9	267·791 0	2
3	65·973 7	185·019	607·794	51·766 6	202·382 1	3
4	50·672 0	134·347	422·775	40·199 2	150·615 5	4
85	38·296 7	96·050 3	288·428	30·692 1	110·416 3	85
6	28·546 0	67·504 3	192·378	23·109 2	79·724 2	6
7	21·014 8	46·489 4	124·874	17·193 8	56·615 0	7
8	15·241 1	31·248 3	78·384	12·609 6	39·421 1	8
9	10·937 7	20·310 6	47·136	9·168 9	26·811 5	9
90	7·705 9	12·604 7	26·825	6·556 3	17·642 6	90
1	5·238 2	7·366 5	14·220	4·524 7	11·086 3	1
2	3·396 2	3·970 3	6·854	2·979 3	6·561 6	2
3	2·078 4	1·891 9	2·884	1·853 7	3·582 3	3
4	1·145 5	·746 4	·992	1·038 4	1·728 6	4
95	·532 4	·213 9	·246	·490 2	·690 2	95
6	·182 3	·031 6	·032	·170 2	·200 0	6
7	·031 6	·000 0	·000	·029 8	·029 8	7

H^M.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	4·746 941	$\bar{1}$·972 561	$\bar{5}$·253 059	0·027 439	5·915 983	971 457	10
1	·719 502	·972 958	·280 498	·027 042	·887 440	971 355	1
2	·692 460	·973 250	·307 540	·026 750	·858 795	971 226	2
3	·665 710	·973 427	·334 290	·026 573	·830 021	971 074	3
4	·639 137	·973 493	·360 863	·026 507	·801 095	970 907	4
15	·612 630	·973 445	·387 370	·026 555	·772 002	970 731	15
6	·586 075	·973 282	·413 925	·026 718	·742 733	970 553	6
7	·559 357	·973 005	·440 643	·026 995	·713 286	970 380	7
8	·532 362	·972 608	·467 638	·027 392	·683 666	970 222	8
9	·504 970	·972 192	·495 030	·027 808	·653 888	970 082	9
20	·477 162	·971 936	·522 838	·028 064	·623 970	969 949	20
1	·449 098	·971 764	·550 902	·028 236	·593 919	969 820	1
2	·420 862	·971 712	·579 138	·028 288	·563 739	969 683	2
3	·392 574	·971 746	·607 426	·028 254	·533 422	969 533	3
4	·364 320	·971 801	·635 680	·028 199	·502 955	969 368	4
25	·336 121	·971 805	·663 879	·028 195	·472 323	969 189	25
6	·307 926	·971 781	·692 074	·028 219	·441 512	968 998	6
7	·279 707	·971 686	·720 293	·028 314	·410 510	968 798	7
8	·251 393	·971 568	·748 607	·028 432	·379 308	968 592	8
9	·222 961	·971 454	·777 039	·028 546	·347 900	968 376	9
30	·194 415	·971 327	·805 585	·028 673	·316 276	968 153	30
1	·165 742	·971 242	·834 258	·028 758	·284 429	967 916	1
2	·136 984	·971 160	·863 016	·028 840	·252 345	967 667	2
3	·108 144	·971 081	·891 856	·028 919	·220 012	967 402	3
4	·079 225	·970 985	·920 775	·029 015	·187 414	967 121	4
35	·050 210	·970 867	·949 790	·029 133	·154 535	966 825	35
6	·021 077	·970 720	·978 923	·029 280	·121 360	966 514	6
7	3·991 797	·970 565	$\bar{4}$·008 203	·029 435	·087 874	966 188	7
8	·962 362	·970 425	·037 638	·029 575	·054 062	965 844	8
9	·932 787	·970 294	·067 213	·029 706	·019 906	965 477	9
40	·903 081	·970 195	·096 919	·029 805	4·985 383	965 085	40
1	·873 276	·970 116	·126 724	·029 884	·950 468	964 660	1
2	·843 392	·970 007	·156 608	·029 993	·915 128	964 205	2
3	·813 399	·969 834	·186 601	·030 166	·879 333	963 717	3
4	·783 233	·969 647	·216 767	·030 353	·843 050	963 197	4
45	·752 880	·969 366	·247 120	·030 634	·806 247	962 647	45
6	·722 246	·969 038	·277 754	·030 962	·768 894	962 068	6
7	·691 284	·968 702	·308 716	·031 298	·730 962	961 458	7
8	·659 986	·968 377	·340 014	·031 623	·692 420	960 810	8
9	·628 363	·968 033	·371 637	·031 967	·653 230	960 122	9
50	·596 396	·967 712	·403 604	·032 288	·613 352	959 384	50
1	·564 108	·967 393	·435 892	·032 607	·572 736	958 592	1
2	·531 501	·967 005	·468 499	·032 995	·531 328	957 741	2
3	·498 506	·966 540	·501 494	·033 460	·489 069	956 831	3
4	·465 046	·966 038	·534 954	·033 962	·445 900	955 858	4

Hᴹ.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{6}$·084 017	028 543	3·780 408	981 004	$\bar{4}$·219 592	018 996	10
1	·112 560	028 645	·761 412	984 899	·238 588	015 101	1
2	·141 205	028 774	·746 311	987 816	·253 689	012 184	2
3	·169 979	028 926	·734 127	989 674	·265 873	010 326	3
4	·198 905	029 093	·723 801	990 589	·276 199	009 411	4
15	·227 998	029 269	·714 390	990 593	·285 610	009 407	15
6	·257 267	029 447	·704 983	989 764	·295 017	010 236	6
7	·286 714	029 620	·694 747	988 195	·305 253	011 805	7
8	·316 334	029 778	·682 942	985 892	·317 058	014 108	8
9	·346 112	029 918	·668 834	983 553	·331 166	016 447	9
20	·376 030	030 051	·652 387	982 323	·347 613	017 677	20
1	·406 081	030 180	·634 710	981 647	·365 290	018 353	1
2	·436 261	030 317	·616 357	981 745	·383 643	018 255	2
3	·466 578	030 467	·598 102	982 382	·401 898	017 618	3
4	·497 045	030 632	·580 484	983 141	·419 516	016 859	4
25	·527 677	030 811	·563 625	983 606	·436 375	016 394	25
6	·558 488	031 002	·547 231	983 920	·452 769	016 080	6
7	·589 490	031 202	·531 151	983 849	·468 849	016 151	7
8	·620 692	031 408	·515 000	983 683	·485 000	016 317	8
9	·652 100	031 624	·498 683	983 551	·501 317	016 449	9
30	·683 724	031 847	·482 234	983 377	·517 766	016 623	30
1	·715 571	032 084	·465 611	983 425	·534 389	016 575	1
2	·747 655	032 333	·449 036	983 503	·550 964	016 497	2
3	·779 988	032 598	·432 539	983 612	·567 461	016 388	3
4	·812 586	032 879	·416 151	983 658	·583 849	016 342	4
35	·845 465	033 175	·399 809	983 623	·600 191	016 377	35
6	·878 640	033 486	·383 432	983 488	·616 568	016 512	6
7	·912 126	033 812	·366 920	983 338	·633 080	016 662	7
8	·945 938	034 156	·350 258	983 279	·649 742	016 721	8
9	·980 094	034 523	·333 537	983 266	·666 463	016 734	9
40	$\bar{5}$·014 617	034 915	·316 803	983 400	·683 197	016 600	40
1	·049 532	035 340	·300 203	983 618	·699 797	016 382	1
2	·084 872	035 795	·283 821	983 747	·716 179	016 253	2
3	·120 667	036 283	·267 568	983 676	·732 432	016 324	3
4	·156 950	036 803	·251 244	983 576	·748 756	016 424	4
45	·193 753	037 353	·234 820	983 213	·765 180	016 787	45
6	·231 106	037 932	·218 033	982 732	·781 967	017 268	6
7	·269 038	038 542	·200 765	982 274	·799 235	017 726	7
8	·307 580	039 190	·183 039	981 886	·816 961	018 114	8
9	·346 770	039 878	·164 925	981 483	·835 075	018 517	9
50	·386 648	040 616	·146 408	981 181	·853 592	018 819	50
1	·427 264	041 408	·127 589	980 826	·872 411	019 174	1
2	·468 672	042 259	·108 415	980 627	·891 585	019 373	2
3	·510 931	043 169	·089 042	979 982	·910 958	020 018	3
4	·554 100	044 142	·069 024	979 394	·930 976	020 606	4

H^{M}.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
55	3·431 084	$\bar{1}$·965 462	4·568 916	0·034 538	4·401 758	954 818	55
6	·396 546	·964 832	·603 454	·035 168	·356 576	953 706	6
7	·361 378	·964 148	·638 622	·035 852	·310 282	952 515	7
8	·325 526	·963 420	·674 474	·036 580	·262 797	951 237	8
9	·288 946	·962 567	·711 054	·037 433	·214 034	949 872	9
60	·251 513	·961 610	·748 487	·038 390	·163 906	948 413	60
1	·213 123	·960 552	·786 877	·039 448	·112 319	946 857	1
2	·173 675	·959 385	·826 325	·040 615	·059 176	945 200	2
3	·133 060	·958 100	·866 940	·041 900	·004 376	943 436	3
4	·091 160	·956 779	·908 840	·043 221	3·947 812	941 546	4
65	·047 939	·955 411	·952 061	·044 589	·889 358	939 512	65
6	·003 350	·953 983	·996 650	·046 017	·828 870	937 308	6
7	2·957 333	·952 469	$\bar{3}$·042 667	·047 531	·766 178	934 905	7
8	·909 802	·950 937	090 198	·049 063	·701 083	932 255	8
9	·860 739	·949 049	·139 261	·050 951	·633 338	929 356	9
70	·809 788	·946 808	·190 212	·053 192	·562 694	926 198	70
1	·756 596	·944 087	·243 404	·055 913	·488 892	922 803	1
2	·700 683	·940 864	·299 317	·059 136	·411 695	919 201	2
3	·641 547	·937 129	·358 453	·062 871	·330 896	915 441	3
4	·578 676	·933 165	·421 324	·066 835	·246 337	911 535	4
75	·511 841	·929 727	·488 159	·070 273	·157 872	907 317	75
6	·441 568	925 851	·558 432	·074 149	·065 189	902 790	6
7	·367 419	·921 791	·632 581	·078 209	2·967 979	897 889	7
8	·289 210	917 588	·710 790	·082 412	·865 868	892 515	8
9	·206 798	·912 684	·793 202	·087 316	·758 383	886 679	9
80	·119 482	·906 837	·880 518	·093 163	645 062	880 483	80
1	·026 319	·899 988	·973 681	·100 012	·525 545	874 116	1
2	1·926 307	·893 064	$\bar{2}$·073 693	·106 936	·399 661	867 555	2
3	·819 371	·885 397	·180 629	·114 603	·267 216	861 012	3
4	·704 768	·878 393	·295 232	·121 607	·128 228	854 271	4
85	·583 161	·872 384	·416 839	·127 616	1·982 499	846 832	85
6	·455 545	·866 981	·544 455	·133 019	·829 331	838 023	6
7	·322 526	·860 491	·677 474	·139 509	·667 354	827 472	7
8	·183 017	·855 908	·816 983	·144 092	·494 826	812 897	8
9	·038 925	·847 900	961 075	·152 100	·307 723	792 810	9
90	0·886 825	·832 357	$\bar{1}$·113 175	·167 643	·100 533	766 728	90
1	·719 182	811 817	280 818	·188 183	0·867 261	731 558	1
2	·530 999	·786 728	·469 001	·213 272	·598 819	678 072	2
3	·317 727	·741 272	·682 273	·258 728	·276 891	596 056	3
4	·058 999	·667 278	·941 001	·332 722	$\bar{1}$·872 947	457 287	4
95	$\bar{1}$·726 277	·534 556	0·273 723	·465 444	·330 234	169 340	95
6	·260 833	238 741	·739 167	·761 259	·499 574		6
7	$\bar{2}$·499 574		·500 426				7

H^{M}.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·598 242	045 182	3·048 418	978 686	$\bar{4}$·951 582	021 314	55
6	·643 424	046 294	·027 104	977 910	·972 896	022 090	6
7	·689 718	047 485	·005 014	977 077	·994 986	022 923	7
8	·737 203	048 763	2·982 091	976 208	$\bar{3}$·017 909	023 792	8
9	·785 966	050 128	·958 299	975 143	·041 701	024 857	9
60	·836 094	051 587	·933 442	973 942	·066 558	026 058	60
1	·887 681	053 143	·907 384	972 616	·092 616	027 384	1
2	·940 824	054 800	·880 000	971 158	·120 000	028 842	2
3	·995 624	056 564	·851 158	969 561	·148 842	030 439	3
4	$\bar{4}$·052 188	058 454	·820 719	967 987	·179 281	032 013	4
65	·110 642	060 488	·788 706	966 411	·211 294	033 589	65
6	·171 130	062 692	·755 117	964 822	·244 883	035 178	6
7	·233 822	065 095	·719 939	963 174	·280 061	036 826	7
8	·298 917	067 745	·683 113	961 592	·316 887	038 408	8
9	·366 662	070 644	·644 705	959 538	·355 295	040 462	9
70	·437 306	073 802	·604 243	957 041	·395 757	042 959	70
1	·511 108	077 197	·561 284	953 926	·438 716	046 074	1
2	·588 305	080 799	·515 210	950 188	·484 790	049 812	2
3	·669 104	084 559	·465 398	945 828	·534 602	054 172	3
4	·753 663	088 465	·411 226	941 259	·588 774	058 741	4
75	·842 128	092 683	·352 485	937 553	·647 515	062 447	75
6	·934 811	097 210	·290 038	933 361	·709 962	066 639	6
7	$\bar{3}$·032 021	102 111	·223 399	929 041	·776 601	070 959	7
8	·134 132	107 485	·152 440	924 660	·847 560	075 340	8
9	·241 617	113 321	·077 100	919 488	·922 900	080 512	9
80	·354 938	119 517	1·996 588	913 233	2·003 412	086 767	80
1	·474 455	125 884	·909 821	905 816	·090 179	094 184	1
2	·600 339	132 445	·815 637	898 413	·184 363	101 587	2
3	·732 784	138 988	·714 050	890 167	·285 950	109 833	3
4	·871 772	145 729	·604 217	882 810	·395 783	117 190	4
85	$\bar{2}$·017 501	153 168	·487 027	876 758	·512 973	123 242	85
6	·170 669	161 977	·363 785	871 588	·636 215	128 412	6
7	·332 646	172 528	·235 373	865 330	·764 627	134 670	7
8	·505 174	187 103	·100 703	861 614	·899 297	138 386	8
9	·692 277	207 190	0·962 317	854 340	$\bar{1}$·037 683	145 660	9
90	·899 467	233 272	·816 657	838 935	·183 343	161 065	90
1	$\bar{1}$·132 739	268 442	·655 592	818 518	·344 408	181 482	1
2	·401 181	321 928	·474 110	793 920	·525 890	206 080	2
3	·723 109	403 944	·268 030	748 346	·731 970	251 654	3
4	$\bar{0}$·127 053	542 713	·016 376	674 001	·983 624	325 999	4
95	·669 766	830 660	$\bar{1}$·690 377	540 619	$\bar{0}$·309 623	459 381	95
6	1·500 426		·230 996	243 272	·769 004	756 728	6
7			$\bar{2}$·474 268		1·525 732		7

Hm.

6 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	14·7585	·108 011	·006 854	55	9·3470	·414 318	·040 042
1	14·7210	·110 131	·007 005	6	9·1207	·427 128	·042 203
2	14·6668	·113 201	·007 226	7	8·8900	·440 186	·044 508
3	14·5986	·117 062	·007 505	8	8·6551	·453 487	·046 969
4	14·5197	·121 525	·007 830	9	8·4157	·467 038	·049 602
15	14·4335	·126 404	·008 190	60	8·1732	·480 761	·052 409
6	14·3436	·131 495	·008 570	1	7·9286	·494 608	·055 396
7	14·2537	·136 581	·008 954	2	7·6825	·508 539	·058 571
8	14·1679	·141 443	·009 325	3	7·4356	·522 513	·061 941
9	14·0902	·145 836	·009 664	4	7·1887	·536 487	·065 515
20	14·0219	·149 701	·009 965	65	6·9410	·550 512	·069 326
1	13·9579	·153 325	·010 250	6	6·6915	·564 635	·073 411
2	13·8956	·156 854	·010 530	7	6·4394	·578 903	·077 816
3	13·8308	·160 520	·010 823	8	6·1842	·593 350	·082 591
4	13·7605	·164 499	·011 145	9	5·9238	·608 087	·087 826
25	13·6836	·168 851	·011 499	70	5·6612	·622 953	·093 520
6	13·6015	·173 502	·011 883	1	5·3988	·637 804	·099 676
7	13·5146	·178 420	·012 292	2	5·1406	·652 420	·106 247
8	13·4250	·183 488	·012 720	3	4·8904	·666 578	·113 163
9	13·3333	·188 678	·013 164	4	4·6522	·680 063	·120 318
30	13·2392	·194 008	·013 625	75	4·4262	·692 857	·127 687
1	13·1428	·199 466	·014 104	6	4·2036	·705 456	·135 571
2	13·0425	·205 141	·014 608	7	3·9862	·717 762	·143 949
3	12·9380	·211 055	·015 142	8	3·7728	·729 844	·152 919
4	12·8289	·217 233	·015 709	9	3·5611	·741 825	·162 641
35	12·7152	·223 665	·016 308	80	3·3541	·753 540	·173 063
6	12·5975	·230 332	·016 939	1	3·1566	·764 719	·183 975
7	12·4761	·237 204	·017 602	2	2·9741	·775 052	·195 026
8	12·3510	·244 285	·018 297	3	2·8044	·784 655	·206 247
9	12·2213	·251 622	·019 032	4	2·6513	·793 322	·217 271
40	12·0866	·259 252	·019 811	85	2·5081	·801 431	·228 454
1	11·9452	·267 256	·020 645	6	2·3648	·809 542	·240 595
2	11·7961	·275 695	·021 545	7	2·2122	·818 177	·254 708
3	11·6395	·284 557	·022 513	8	2·0503	·827 344	·271 237
4	11·4767	·293 772	·023 546	9	1·8569	·838 286	·293 421
45	11·3075	·303 348	·024 647	90	1·6357	·850 809	·322 800
6	11·1339	·313 175	·025 810	1	1·4063	·863 794	·358 971
7	10·9567	·323 207	·027 032	2	1·1690	·877 225	·404 435
8	10·7754	·333 467	·028 319	3	·9103	·891 873	·466 886
9	10·5893	·344 003	·029 683	4	·6516	·906 519	·548 889
50	10·3981	·354 823	·031 130	95	·4018	·920 661	·656 794
1	10·2007	·366 000	·032 677	6	·1733	·933 605	·795 725
2	9·9960	·377 497	·034 330	7	·0000	·943 396	·943 396
3	9·7850	·389 526	·036 117				
4	9·5687	·401 770	·038 015				

ONE LIFE.

II.

H^F.

HEALTHY FEMALE LIVES.

H^{F}.

Elementary Values.

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
10	100 000	5·000 000	$\bar{1}$·998 634	999 533	$\bar{5}$·000 000	10
1	99 686	4·998 634	·998 167	999 595	·001 366	1
2	99 266	·996 801	·997 762	999 676	·003 199	2
3	98 756	·994 563	·997 438	999 757	·005 437	3
4	98 175	·992 001	·997 195	999 825	·007 999	4
15	97 543	·989 196	·997 020	999 907	·010 804	15
6	96 876	·986 216	·996 927	999 992	·013 784	6
7	96 193	·983 143	·996 919	000 075	·016 857	7
8	95 513	·980 062	·996 994	000 088	·019 938	8
9	94 854	·977 056	·997 082	999 921	·022 944	9
20	94 219	·974 138	·997 003	999 820	·025 862	20
1	93 571	·971 141	·996 823	999 722	·028 859	1
2	92 889	·967 964	·996 545	999 607	·032 036	2
3	92 153	·964 509	·996 152	999 552	·035 491	3
4	91 340	·960 661	·995 704	999 574	·039 339	4
25	90 441	·956 365	·995 278	999 752	·043 635	25
6	89 463	·951 643	·995 030	999 808	·048 357	6
7	88 445	·946 673	·994 838	999 913	·053 327	7
8	87 400	·941 511	·994 751	000 028	·058 489	8
9	86 350	·936 262	·994 779	000 044	·063 738	9
30	85 318	·931 041	·994 823	000 062	·068 959	30
1	84 307	·925 864	·994 885	000 061	·074 136	1
2	83 320	·920 749	·994 946	999 962	·079 251	2
3	82 356	·915 695	·994 908	999 972	·084 305	3
4	81 396	·910 603	·994 880	999 982	·089 397	4
35	80 442	·905 483	·994 862	999 939	·094 517	35
6	79 496	·900 345	·994 801	999 937	·099 655	6
7	78 550	·895 146	·994 738	999 935	·104 854	7
8	77 604	·889 884	·994 673	999 935	·110 116	8
9	76 658	·884 557	·994 608	999 908	·115 443	9
40	75 712	·879 165	·994 516	999 912	·120 835	40
1	74 762	·873 681	·994 428	999 916	·126 319	1
2	73 809	·868 109	·994 344	999 908	·131 891	2
3	72 854	·862 453	·994 252	999 897	·137 547	3
4	71 896	·856 705	·994 149	999 896	·143 295	4
45	70 934	·850 854	·994 045	999 937	·149 146	45
6	69 968	·844 899	·993 982	999 946	·155 101	6
7	69 005	·838 881	·993 928	999 947	·161 119	7
8	68 047	·832 809	·993 875	999 931	·167 191	8
9	67 094	·826 684	·993 806	999 872	·173 316	9
50	66 144	·820 490	·993 678	999 777	·179 510	50
1	65 188	·814 168	·993 455	999 708	·185 832	1
2	64 213	·807 623	·993 163	999 653	·192 377	2
3	63 210	·800 786	·992 816	999 566	·199 214	3
4	62 173	·793 602	·992 382	999 611	·206 398	4

HF.

Elementary Values.

x	Colog p_x	Δ	d_x	Log d_x	Δ	—Δ	x
10	0·001 366	000 467	314	2·496 930	126 319	873 681	10
1	·001 833	000 405	420	·623 249	084 321	915 679	1
2	·002 238	000 324	510	·707 570	056 606	943 394	2
3	·002 562	000 243	581	·764 176	036 541	963 459	3
4	·002 805	000 175	632	·800 717	023 409	976 591	4
15	·002 980	000 093	667	·824 126	010 295	989 705	·15
6	·003 073	000 008	683	·834 421	998 088	001 912	6
7	·003 081	999 925	680	·832 509	986 376	013 624	7
8	·003 006	999 912	659	·818 885	983 889	016 111	8
9	·002 918	000 079	635	·802 774	008 801	991 199	9
20	·002 997	000 180	648	·811 575	022 209	977 791	20
1	·003 177	000 278	682	·833 784	032 894	967 106	1
2	·003 455	000 393	736	·866 678	043 413	956 587	2
3	·003 848	000 448	813	·910 091	043 669	956 331	3
4	·004 296	000 426	899	·953 760	036 579	963 421	4
25	·004 722	000 248	978	·990 339	017 409	982 591	25
6	·004 970	000 192	1018	3·007 748	011 368	988 632	6
7	·005 162	000 087	1045	·019 116	002 073	997 927	7
8	·005 249	999 972	1050	·021 189	992 491	007 509	8
9	·005 221	999 956	1032	·013 680	991 071	008 929	9
30	·005 177	999 938	1011	·004 751	989 566	010 434	30
1	·005 115	999 939	987	2·994 317	989 760	010 240	1
2	·005 054	000 038	964	·984 077	998 194	001 806	2
3	·005 092	000 028	960	·982 271	997 277	002 723	3
4	·005 120	000 018	954	·979 548	996 343	003 657	4
35	·005 138	000 061	946	·975 891	000 000	000 000	35
6	·005 199	000 063	946	·975 891	000 000	000 000	6
7	·005 262	000 065	946	·975 891	000 000	000 000	7
8	·005 327	000 065	946	·975 891	000 000	000 000	8
9	·005 392	000 092	946	·975 891	001 833	998 167	9
40	·005 484	000 088	950	·977 724	001 369	998 631	40
1	·005 572	000 084	953	·979 093	000 910	999 090	1
2	·005 656	000 092	955	·980 003	001 363	998 637	2
3	·005 748	000 103	958	·981 366	001 809	998 191	3
4	·005 851	000 104	962	·983 175	001 802	998 198	4
45	·005 955	000 063	966	·984 977	998 649	001 351	45
6	·006 018	000 054	963	·983 626	997 740	002 260	6
7	·006 072	000 053	958	·981 366	997 727	002 273	7
8	·006 125	000 069	953	·979 093	998 631	001 369	8
9	·006 194	000 128	950	·977 724	002 734	997 266	9
50	·006 322	000 223	956	·980 458	008 547	991 453	50
1	·006 545	000 292	975	·989 005	012 296	987 704	1
2	·006 837	000 347	1003	3·001 301	014 478	985 522	2
3	·007 184	000 434	1037	·015 779	018 047	981 953	3
4	·007 618	000 389	1081	·033 826	013 838	986 162	4

HF.

Elementary Values—(continued).

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
55	61 092	4·785 984	$\bar{1}$·991 993	999 644	$\bar{5}$·214 016	55
6	59 976	·777 977	·991 637	999 639	·222 023	6
7	58 832	·769 614	·991 276	999 621	·230 386	7
8	57 662	·760 890	·990 897	999 530	·239 110	8
9	56 466	·751 787	·990 427	999 165	·248 213	9
60	55 235	·742 214	·989 592	999 026	·257 786	60
1	53 927	·731 806	·988 618	998 843	·268 194	1
2	52 532	·720 424	·987 461	998 697	·279 576	2
3	51 037	·707 885	·986 158	998 590	·292 115	3
4	49 436	·694 043	·984 748	998 709	·305 957	4
65	47 730	·678 791	·983 457	998 734	·321 209	65
6	45 946	·662 248	·982 191	998 538	·337 752	6
7	44 100	·644 439	·980 729	998 372	·355 561	7
8	42 186	·625 168	·979 101	998 170	·374 832	8
9	40 204	·604 269	·977 271	997 865	·395 731	9
70	38 154	·581 540	·975 136	997 092	·418 460	70
1	36 031	·556 676	·972 228	996 641	·443 324	1
2	33 799	·528 904	·968 869	996 295	·471 096	2
3	31 461	·497 773	·965 164	995 898	·502 227	3
4	29 036	·462 937	·961 062	995 657	·537 063	4
75	26 546	·423 999	·956 719	995 567	·576 001	75
6	24 028	·380 718	·952 286	997 219	·619 282	6
7	21 528	·333 004	·949 505	997 412	·666 996	7
8	19 165	·282 509	·946 917	997 891	·717 491	8
9	16 960	·229 426	·944 808	998 793	·770 574	9
80	14 936	·174 234	·943 601	999 111	·825 766	80
1	13 117	·117 835	·942 712	995 959	·882 165	1
2	11 496	·060 547	·938 671	993 162	·939 453	2
3	9 982	3·999 218	·931 833	990 997	$\bar{4}$·000 782	3
4	8 532	·931 051	·922 830	987 988	·068 949	4
85	7 143	·853 881	·910 818	985 633	·146 119	85
6	5 817	·764 699	·896 451	986 095	·235 301	6
7	4 583	·661 150	·882 546	987 728	·338 850	7
8	3 497	·543 696	·870 274	991 528	·456 304	8
9	2 594	·413 970	·861 802	998 512	·586 030	9
90	1 887	·275 772	·860 314	003 600	·724 228	90
1	1 368	·136 086	·863 914	021 447	·863 914	1
2	1 000	·000 000	·885 361	028 619	$\bar{3}$·000 000	2
3	768	2·885 361	·913 980	996 796	·114 639	3
4	630	·799 341	·910 776	987 633	·200 659	4
95	513	·710 117	·898 409	973 072	·289 883	95
6	406	·608 526	·871 481	949 542	·391 474	6
7	302	·480 007	·821 023	877 947	·519 993	7
8	200	·301 030	·698 970		·698 970	8
9	100	·000 000			$\bar{2}$·000 000	9

H^F.

Elementary Values—(continued).

x	Colog p_x	Δ	d_x	Log d_x	Δ	$-\Delta$	x
55	0·008 007	000 356	1116	3·047 664	010 762	989 238	55
6	·008 363	000 361	1144	·058 426	009 760	990 240	6
7	·008 724	000 379	1170	·068 186	009 545	990 455	7
8	·009 103	000 470	1196	·077 731	012 527	987 473	8
9	·009 573	000 835	1231	·090 258	026 350	973 650	9
60	·010 408	000 974	1308	·116 608	027 966	972 034	60
1	·011 382	001 157	1395	·144 574	030 067	969 933	1
2	·012 539	001 303	1495	·174 641	029 750	970 250	2
3	·013 842	001 410	1601	·204 391	027 588	972 412	3
4	·015 252	001 291	1706	·231 979	019 416	980 584	4
65	·016 543	001 266	1784	·251 395	014 837	985 163	65
6	·017 809	001 462	1846	·266 232	015 710	984 290	6
7	·019 271	001 628	1914	·281 942	015 162	984 838	7
8	·020 899	001 830	1982	·297 104	014 650	985 350	8
9	·022 729	002 135	2050	·311 754	015 196	984 804	9
70	·024 864	002 908	2123	·326 950	021 744	978 256	70
1	·027 772	003 359	2232	·348 694	020 151	979 849	1
2	·031 131	003 705	2338	·368 845	015 867	984 133	2
3	·034 836	004 102	2425	·384 712	011 487	988 513	3
4	·038 938	004 343	2490	·396 199	004 857	995 143	4
75	·043 281	004 433	2518	·401 056	996 884	003 116	75
6	·047 714	002 781	2500	·397 940	975 524	024 476	6
7	·050 495	002 588	2363	·373 464	969 945	030 055	7
8	·053 083	002 109	2205	·343 409	962 802	037 198	8
9	·055 192	001 207	2024	·306 211	953 622	046 378	9
80	·056 399	000 889	1819	·259 833	949 950	050 050	80
1	·057 288	004 041	1621	·209 783	970 343	029 657	1
2	·061 329	006 838	1514	·180 126	981 242	018 758	2
3	·068 167	009 003	1450	·161 368	981 334	018 666	3
4	·077 170	012 012	1389	·142 702	979 842	020 158	4
85	·089 182	014 367	1326	·122 544	968 771	031 229	85
6	·103 549	013 905	1234	·091 315	944 515	055 485	6
7	·117 454	012 272	1086	·035 830	919 858	080 142	7
8	·129 726	008 472	903	2·955 688	893 731	106 269	8
9	·138 198	001 488	707	·849 419	865 748	134 252	9
90	·139 686	996 400	519	·715 167	850 681	149 319	90
1	·136 086	978 553	368	·565 848	799 640	200 360	1
2	·114 639	971 381	232	·365 488	774 391	225 609	2
3	·086 020	003 204	138	·139 879	928 307	071 693	3
4	·089 224	012 367	117	·068 186	961 198	038 802	4
95	·101 591	026 928	107	·029 384	987 649	012 351	95
6	·128 519	050 458	104	·017 033	991 567	008 433	6
7	·178 977	122 053	102	·008 600	991 400	008 600	7
8	·301 030		100	·000 000	000 000	000 000	8
9			100	·000 000			9

HF.

Probabilities of Living over, and of Dying in, a Year, and the Average Duration of Life, at each Age.

x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$	x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$
10	·996 860	·003 140	48·195	55	·981 732	·018 268	18·192
1	·995 787	·004 213	47·346	6	·980 926	·019 074	17·521
2	·994 862	·005 138	46·544	7	·980 113	·019 887	16·852
3	·994 117	·005 883	45·782	8	·979 258	·020 742	16·184
4	·993 562	·006 438	45·050	9	·978 199	·021 801	15·516
15	·993 162	·006 838	44·338	60	·976 319	·023 681	14·851
6	·992 950	·007 050	43·640	1	·974 132	·025 868	14·199
7	·992 931	·007 069	42·946	2	·971 541	·028 459	13·563
8	·993 100	·006 900	42·249	3	·968 631	·031 369	12·945
9	·993 305	·006 695	41·539	4	·965 491	·034 509	12·349
20	·993 122	·006 878	40·815	65	·962 623	·037 377	11·772
1	·992 711	·007 289	40·094	6	·959 822	·040 178	11·210
2	·992 080	·007 920	39·385	7	·956 599	·043 401	10·658
3	·991 178	·008 822	38·696	8	·953 018	·046 982	10·119
4	·990 158	·009 842	38·036	9	·949 010	·050 990	9·593
25	·989 186	·010 814	37·409	70	·944 357	·055 643	9·082
6	·988 621	·011 379	36·812	1	·938 053	·061 947	8·587
7	·988 185	·011 815	36·230	2	·930 826	·069 174	8·121
8	·987 986	·012 014	35·657	3	·922 921	·077 079	7·688
9	·988 049	·011 951	35·085	4	·914 245	·085 755	7·288
30	·988 150	·011 850	34·503	75	·905 146	·094 854	6·925
1	·988 293	·011 707	33·911	6	·895 955	·104 045	6·598
2	·988 430	·011 570	33·307	7	·890 236	·109 764	6·306
3	·988 343	·011 657	32·691	8	·884 946	·115 054	6·022
4	·988 280	·011 720	32·070	9	·880 660	·119 340	5·740
35	·988 240	·011 760	31·445	80	·878 214	·121 786	5·450
6	·988 100	·011 900	30·813	1	·876 420	·123 580	5·137
7	·987 957	·012 043	30·178	2	·868 302	·131 698	4·790
8	·987 810	·012 190	29·540	3	·854 739	·145 261	4·441
9	·987 659	·012 341	28·898	4	·837 201	·162 799	4·111
40	·987 453	·012 547	28·253	85	·814 363	·185 637	3·813
1	·987 253	·012 747	27·606	6	·787 864	·212 136	3·568
2	·987 061	·012 939	26·956	7	·763 038	·236 962	3·394
3	·986 850	·013 150	26·302	8	·741 779	·258 221	3·293
4	·986 620	·013 380	25·646	9	·727 448	·272 552	3·266
45	·986 382	·013 618	24·987	90	·724 960	·275 040	3·302
6	·986 237	·013 763	24·325	1	·730 994	·269 006	3·365
7	·986 117	·013 883	23·658	2	·768 000	·232 000	3·419
8	·985 995	·014 005	22·984	3	·820 312	·179 688	3·301
9	·985 841	·014 159	22·303	4	·814 286	·185 714	2·914
50	·985 547	·014 453	21·616	95	·791 423	·208 577	2·465
1	·985 043	·014 957	20·926	6	·743 843	·256 157	1·983
2	·984 380	·015 620	20·236	7	·662 252	·337 748	1·493
3	·983 594	·016 406	19·549	8	·500 000	·500 000	1·000
4	·982 613	·017 387	18·867	9	·000 000	1·000 000	·500

H[F].

THREE PER-CENT.

Hᶠ.

3 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	74 409·4	1 729 035·	34 562 827·	21 881·9	744 232·8	10
1	72 015·3	1 657 020·	32 833 792·	21 655·0	722 350·9	1
2	69 623·2	1 587 397·	31 176 772·	21 360·5	700 695·9	2
3	67 248·0	1 520 149·	29 589 375·	21 013·2	679 335·4	3
4	64 905·2	1 455 244·	28 069 226·	20 629·1	658 322·3	4
15	62 609·1	1 392 634·	26 613 982·	20 223·4	637 693·2	15
6	60 369·9	1 332 265·	25 221 348·	19 807·7	617 469·8	6
7	58 198·4	1 274 066·	23 889 083·	19 394·5	597 662·1	7
8	56 103·8	1 217 962·	22 615 017·	18 995·1	578 267·5	8
9	54 093·9	1 163 868·	21 397 055·	18 619·3	559 272·4	9
20	52 166·8	1 111 702·	20 233 186·	18 267·7	540 653·2	20
1	50 299·0	1 061 403·	19 121 484·	17 919·4	522 385·5	1
2	48 478·1	1 012 925·	18 060 082·	17 563·4	504 466·1	2
3	46 693·2	966 231·4	17 047 157·	17 190·5	486 902·7	3
4	44 933·2	921 298·2	16 080 926·	16 790·6	469 712·2	4
25	43 195·1	878 103·1	15 159 628·	16 361·2	452 921·6	25
6	41 483·5	836 619·6	14 281 524·	15 907·7	436 560·4	6
7	39 817·0	796 802·6	13 444 905·	15 449·4	420 652·7	7
8	38 200·5	758 602·1	12 648 102·	14 992·7	405 203·3	8
9	36 642·3	721 959·8	11 889 500·	14 547·1	390 210·7	9
30	35 149·9	686 809·9	11 167 540·	14 121·9	375 663·6	30
1	33 721·7	653 088·2	10 480 731·	13 717·5	361 541·6	1
2	32 356·3	620 731·9	9 827 642·	13 334·3	347 824·1	2
3	31 050·4	589 681·6	9 206 910·	12 970·8	334 489·8	3
4	29 794·6	559 887·0	8 617 229·	12 619·4	321 519·0	4
35	28 587·8	531 299·2	8 057 342·	12 280·4	308 899·6	35
6	27 428·7	503 870·5	7 526 043·	11 954·0	296 619·3	6
7	26 312·9	477 557·6	7 022 172·	11 637·1	284 665·3	7
8	25 238·9	452 318·7	6 544 615·	11 329·4	273 028·2	8
9	24 205·0	428 113·7	6 092 296·	11 030·7	261 698·8	9
40	23 210·0	404 903·7	5 664 182·	10 740·7	250 668·1	40
1	22 251·3	382 652·4	5 259 279·	10 458·0	239 927·4	1
2	21 327·8	361 324·6	4 876 626·	10 182·6	229 469·5	2
3	20 438·7	340 886·0	4 515 302·	9 914·65	219 286·9	3
4	19 582·4	321 303·5	4 174 416·	9 653·72	209 372·3	4
45	18 757·7	302 545·8	3 853 112·	9 399·33	199 718·5	45
6	17 963·3	284 582·5	3 550 566·	9 151·33	190 319·2	6
7	17 200·1	267 382·4	3 265 984·	8 911·29	181 167·9	7
8	16 467·3	250 915·1	2 998 601·	8 679·45	172 256·6	8
9	15 763·8	235 151·3	2 747 686·	8 455·55	163 577·1	9
50	15 087·9	220 063·4	2 512 535·	8 238·85	155 121·6	50
1	14 436·7	205 626·7	2 292 472·	8 027·13	146 882·7	1
2	13 806·6	191 820·1	2 086 845·	7 817·49	138 855·6	2
3	13 195·1	178 624·9	1 895 025·	7 608·11	131 038·1	3
4	12 600·6	166 024·3	1 716 400·	7 397·94	123 430·0	4

H^F.
3 PER-CENT.
Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
55	12 020·9	154 003·4	1 550 376·	7 185·24	116 032·1	55
6	11 457·6	142 545·9	1 396 372·	6 972·04	108 846·8	6
7	10 911·7	131 634·2	1 253 826·	6 759·86	101 874·8	7
8	10 383·2	121 251·0	1 122 192·	6 549·18	95 114·93	8
9	9 871·67	111 379·3	1 000 941·	6 340·09	88 565·75	9
60	9 375·21	102 004·1	889 561·8	6 131·15	82 225·66	60
1	8 886·60	93 117·50	787 557·7	5 915·60	76 094·51	1
2	8 404·58	84 712·92	694 440·2	5 692·42	70 178·91	2
3	7 927·57	76 785·35	609 727·3	5 460·20	64 486·49	3
4	7 455·23	69 330·12	532 942·0	5 218·76	59 026·29	4
65	6 988·31	62 341·82	463 611·8	4 968·98	53 807·53	65
6	6 531·17	55 810·65	401 270·0	4 715·39	48 838·55	6
7	6 086·18	49 724·47	345 459·4	4 460·62	44 123·16	7
8	5 652·45	44 072·02	295 734·9	4 204·17	39 662·54	8
9	5 229·99	38 842·03	251 662·9	3 946·34	35 458·37	9
70	4 818·75	34 023·28	212 820·9	3 687·43	31 512·04	70
1	4 418·08	29 605·20	178 797·6	3 427·11	27 824·61	1
2	4 023·68	25 581·52	149 192·4	3 161·39	24 397·50	2
3	3 636·26	21 945·26	123 610·9	2 891·17	21 236·11	3
4	3 258·23	18 687·03	101 665·6	2 619·05	18 344·94	4
75	2 892·06	15 794·97	82 978·57	2 347·78	15 725·89	75
6	2 541·49	13 253·48	67 183·61	2 081·44	13 378·11	6
7	2 210·74	11 042·74	53 930·13	1 824·71	11 296·67	7
8	1 910·76	9 131·980	42 887·40	1 589·12	9 471·955	8
9	1 641·67	7 490·313	33 755·42	1 375·69	7 882·832	9
80	1 403·64	6 086·671	26 265·10	1 185·48	6 507·145	80
1	1 196·79	4 889·877	20 178·43	1 019·51	5 321·668	1
2	1 018·34	3 871·533	15 288·55	875·920	4 302·156	2
3	858·476	3 013·058	11 417·02	745·713	3 426·236	3
4	712·400	2 300·658	8 403·964	624·641	2 680·523	4
85	579·051	1 721·607	6 103·307	512·041	2 055·882	85
6	457·823	1 263·784	4 381·700	407·679	1 543·841	6
7	350·196	913·588	3 117·916	313·387	1 136·161	7
8	259·430	654·158	2 204·329	232·820	822·774	8
9	186·835	467·323	1 550·171	167·781	589·954	9
90	131·954	335·370	1 082·848	118·342	422·173	90
1	92·875 0	242·495	747·478	83·106 9	303·830	1
2	65·913 6	176·581	504·984	58·850 7	220·723	2
3	49·147 3	127·434	328·403	44·004 1	161·873	3
4	39·141 9	88·292	200·969	35·430 2	117·869	4
95	30·944 3	57·347	112·677	28·372 7	82·438	95
6	23·776 7	33·571	55·330	22·106 4	54·066	6
7	17·171 0	16·400	21·759	16·193 2	31·959	7
8	11·040 3	5·359	5·359	10·562 7	15·766	8
9	5·359 4	·000	·000	5·203 3	5·203	9

H^F.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·871 628	$\bar{1}$·985 797	5·128 372	0·014 203	6·237 804	981 524	10
1	·857 425	·985 329	·142 575	·014 671	·219 328	981 358	1
2	·842 754	·984 926	·157 246	·015 074	·200 686	981 200	2
3	·827 680	·984 600	·172 320	·015 400	·181 886	981 050	3
4	·812 280	·984 358	·187 720	·015 642	·162 936	980 901	4
15	·796 638	·984 183	·203 362	·015 817	·143 837	980 754	15
6	·780 821	·984 090	·219 179	·015 910	·124 591	980 601	6
7	·764 911	·984 082	·235 089	·015 918	·105 192	980 442	7
8	·748 993	·984 155	·251 007	·015 845	·085 634	980 270	8
9	·733 148	·984 246	·266 852	·015 754	·065 904	980 084	9
20	·717 394	·984 166	·282 606	·015 834	·045 988	979 892	20
1	·701 560	·983 985	·298 440	·016 015	·025 880	979 697	1
2	·685 545	·983 708	·314 455	·016 292	·005 577	979 504	2
3	·669 253	·983 315	·330 747	·016 685	5·985 081	979 319	3
4	·652 568	·982 867	·347 432	·017 133	·964 400	979 146	4
25	·635 435	·982 441	·364 565	·017 559	·943 546	978 982	25
6	·617 876	·982 192	·382 124	·017 808	·922 528	978 823	6
7	·600 068	·982 001	·399 932	·017 999	·901 351	978 663	7
8	·582 069	·981 914	·417 931	·018 086	·880 014	978 499	8
9	·563 983	·981 941	·436 017	·018 059	·858 513	978 324	9
30	·545 924	·981 986	·454 076	·018 014	·836 837	978 135	30
1	·527 910	·982 048	·472 090	·017 952	·814 972	977 932	1
2	·509 958	·982 109	·490 042	·017 891	·792 904	977 714	2
3	·492 067	·982 071	·507 933	·017 929	·770 618	977 482	3
4	·474 138	·982 042	·525 862	·017 958	·748 100	977 239	4
35	·456 180	·982 025	·543 820	·017 975	·725 339	976 980	35
6	·438 205	·981 964	·561 795	·018 036	·702 319	976 707	6
7	·420 169	·981 901	·579 831	·018 099	·679 026	976 419	7
8	·402 070	·981 836	·597 930	·018 164	·655 445	976 114	8
9	·383 906	·981 770	·616 094	·018 230	·631 559	975 793	9
40	·365 676	·981 679	·634 324	·018 321	·607 352	975 452	40
1	·347 355	·981 591	·652 645	·018 409	·582 804	975 094	1
2	·328 946	·981 507	·671 054	·018 493	·557 898	974 711	2
3	·310 453	·981 414	·689 547	·018 586	·532 609	974 306	3
4	·291 867	·981 312	·708 133	·018 688	·506 915	973 876	4
45	·273 179	·981 208	·726 821	·018 792	·480 791	973 417	45
6	·254 387	·981 144	·745 613	·018 856	·454 208	972 925	6
7	·235 531	·981 091	·764 469	·018 909	·427 133	972 394	7
8	·216 622	·981 038	·783 378	·018 962	·399 527	971 821	8
9	·197 660	·980 969	·802 340	·019 031	·371 348	971 200	9
50	·178 629	·980 840	·821 371	·019 160	·342 548	970 532	50
1	·159 469	·980 618	·840 531	·019 382	·313 080	969 814	1
2	·140 087	·980 326	·859 913	·019 674	·282 894	969 048	2
3	·120 413	·979 979	·879 587	·020 021	·251 942	968 230	3
4	·100 392	·979 545	·899 608	·020 455	·220 172	967 358	4

Hf.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·762 196	018 476	4·340 085	995 474	$\bar{5}$·659 915	004 526	10
1	·780 672	018 642	·335 559	994 051	·664 441	005 949	1
2	·799 314	018 800	·329 610	992 882	·670 390	007 118	2
3	·818 114	018 950	·322 492	991 987	·677 508	008 013	3
4	·837 064	019 099	·314 479	991 375	·685 521	008 625	4
15	·856 163	019 246	·305 854	990 981	·694 146	009 019	15
6	·875 409	019 399	·296 835	990 844	·703 165	009 156	6
7	·894 808	019 558	·287 679	990 962	·712 321	009 038	7
8	·914 366	019 730	·278 641	991 322	·721 359	008 678	8
9	·934 096	019 916	·269 963	991 721	·730 037	008 279	9
20	·954 012	020 108	·261 684	991 639	·738 316	008 361	20
1	·974 120	020 303	·253 323	991 286	·746 677	008 714	1
2	·994 423	020 496	·244 609	990 680	·755 391	009 320	2
3	$\bar{6}$·014 919	020 681	·235 289	989 776	·764 711	010 224	3
4	·035 600	020 854	·225 065	988 750	·774 935	011 250	4
25	·056 454	021 018	·213 815	987 792	·786 185	012 208	25
6	·077 472	021 177	·201 607	987 305	·798 393	012 695	6
7	·098 649	021 337	·188 912	986 967	·811 088	013 033	7
8	·119 986	021 501	·175 879	986 897	·824 121	013 103	8
9	·141 487	021 676	·162 776	987 118	·837 224	012 882	9
30	·163 163	021 865	·149 894	987 382	·850 106	012 618	30
1	·185 028	022 068	·137 276	987 693	·862 724	012 307	1
2	·207 096	022 286	·124 969	987 998	·875 031	012 002	2
3	·229 382	022 518	·112 967	988 072	·887 033	011 928	3
4	·251 900	022 761	·101 039	988 172	·898 961	011 828	4
35	·274 661	023 020	·089 211	988 301	·910 789	011 699	35
6	·297 681	023 293	·077 512	988 332	·922 488	011 668	6
7	·320 974	023 581	·065 844	988 363	·934 156	011 637	7
8	·344 555	023 886	·054 207	988 396	·945 793	011 604	8
9	·368 441	024 207	·042 603	988 430	·957 397	011 570	9
40	·392 648	024 548	·031 033	988 414	·968 967	011 586	40
1	·417 196	024 906	·019 447	988 411	·980 553	011 589	1
2	·442 102	025 289	·007 858	988 420	·992 142	011 580	2
3	·467 391	025 694	3·996 278	988 417	$\bar{4}$·003 722	011 583	3
4	·493 085	026 124	·984 695	988 402	·015 305	011 598	4
45	·519 209	026 583	·973 097	988 387	·026 903	011 613	45
6	·545 792	027 075	·961 484	988 457	·038 516	011 543	6
7	·572 867	027 606	·949 941	988 551	·050 059	011 449	7
8	·600 473	028 179	·938 492	988 650	·061 508	011 350	8
9	·628 652	028 800	·927 142	988 724	·072 858	011 276	9
50	·657 452	029 468	·915 866	988 694	·084 134	011 306	50
1	·686 920	030 186	·904 560	988 507	·095 440	011 493	1
2	·717 106	030 952	·893 067	988 210	·106 933	011 790	2
3	·748 058	031 770	·881 277	987 834	·118 723	012 166	3
4	·779 828	032 642	·869 111	987 330	·130 889	012 670	4

H^F.

3 PER CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
55	4·079 937	1·979 156	5·920 063	0·020 844	5·187 530	966 425	55
6	·059 093	·978 799	·940 907	·021 201	·153 955	965 414	6
7	·037 892	·978 439	·962 108	·021 561	·119 369	964 316	7
8	·016 331	·978 060	·983 669	·021 940	·083 685	963 120	8
9	3·994 391	·977 590	4·005 609	·022 410	·046 805	961 813	9
60	·971 981	·976 755	·028 019	·023 245	·008 618	960 413	60
1	·948 736	·975 780	·051 264	·024 220	4·969 031	958 919	1
2	·924 516	·974 624	·075 484	·025 376	·927 950	957 328	2
3	·899 140	·973 321	·100 860	·026 679	·885 278	955 644	3
4	·872 461	·971 911	·127 539	·028 089	·840 922	953 857	4
65	·844 372	·970 619	·155 628	·029 381	·794 779	951 938	65
6	·814 991	·969 354	·185 009	·030 646	·746 717	949 853	6
7	·784 345	·967 892	·215 655	·032 108	·696 570	947 593	7
8	·752 237	·966 264	·247 763	·033 736	·644 163	945 139	8
9	·718 501	·964 433	·281 499	·035 567	·589 302	942 474	9
70	·682 934	·962 299	·317 066	·037 701	·531 776	939 592	70
1	·645 233	·959 391	·354 767	·040 609	·471 368	936 558	1
2	·604 624	·956 031	·395 376	·043 969	·407 926	933 415	2
3	·560 655	·952 327	·439 345	·047 673	·341 341	930 199	3
4	·512 982	·948 225	·487 018	·051 775	·271 540	926 979	4
75	·461 207	·943 882	·538 793	·056 118	.198 519	923 811	75
6	·405 089	·939 448	·594 911	·060 552	·122 330	920 747	6
7	·344 537	·936 668	·655 463	·063 332	·043 077	917 488	7
8	·281 205	·934 080	·718 795	·065 920	3·960 565	913 935	8
9	·215 285	·931 971	·784 715	·068 029	·874 500	909 880	9
80	·147 256	·930 763	·852 744	·069 237	·784 380	904 918	80
1	·078 019	·929 875	·921 981	·070 125	·689 298	898 585	1
2	·007 894	·925 834	·992 106	·074 166	·587 883	891 124	2
3	2·933 728	·918 996	$\bar{3}$·066 272	·081 004	·479 007	882 845	3
4	·852 724	·909 993	·147 276	·090 007	·361 852	874 082	4
85	·762 717	·897 981	·237 283	·102 019	·235 934	865 739	85
6	·660 698	·883 613	·339 302	·116 387	·101 673	859 077	6
7	·544 311	·869 709	·455 689	·130 291	2·960 750	854 933	7
8	·414 020	·857 437	·585 980	·142 563	·815 683	853 934	8
9	·271 457	·848 965	·728 543	·151 035	·669 617	855 907	9
90	·120 422	·847 477	·879 578	·152 523	·525 524	859 178	90
1	1·967 899	·851 076	$\bar{2}$·032 101	·148 924	·384 702	862 242	1
2	·818 975	·872 524	·181 025	·127 476	·246 944	858 340	2
3	·691 499	·901 142	·308 501	·098 858	·105 284	840 636	3
4	·592 641	·897 940	·407 359	·102 060	1·945 920	812 594	4
95	·490 581	·885 571	·509 419	·114 429	·758 514	767 447	95
6	·376 152	·858 644	·623 848	·141 356	·525 961	688 875	6
7	·234 796	·808 186	·765 204	·191 814	·214 836	514 279	7
8	·042 982	·686 133	·957 018	·313 867	0·729 115		8
9	0·729 115		$\bar{1}$·270 885				9

H^F.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{6}$·812 470	033 575	3·856 441	986 919	$\bar{4}$·143 559	013 081	55
6	·846 045	034 586	·843 360	986 578	·156 640	013 422	6
7	·880 631	035 684	·829 938	986 249	·170 062	013 751	7
8	·916 315	036 880	·816 187	985 908	·183 813	014 092	8
9	·953 195	038 187	·802 095	985 447	·197 905	014 553	9
60	·991 382	039 587	·787 542	984 457	·212 458	015 543	60
1	$\bar{5}$·030 969	041 081	·771 999	983 298	·228 001	016 702	1
2	·072 050	042 672	·755 297	981 912	·244 703	018 088	2
3	·114 722	044 356	·737 209	980 358	·262 791	019 642	3
4	·159 078	046 143	·717 567	978 700	·282 433	021 300	4
65	·205 221	048 062	·696 267	977 250	·303 733	022 750	65
6	·253 283	050 147	·673 517	975 879	·326 483	024 121	6
7	·303 430	052 407	·649 396	974 284	·350 604	025 716	7
8	·355 837	054 861	·623 680	972 514	·376 320	027 486	8
9	·410 698	057 526	·596 194	970 530	·403 806	029 470	9
70	·468 224	060 408	·566 724	968 204	·433 276	031 796	70
1	·528 632	063 442	·534 928	964 951	·465 072	035 049	1
2	·592 074	066 585	·499 879	961 194	·500 121	038 806	2
3	·658 659	069 801	·461 073	957 071	·538 927	042 929	3
4	·728 460	073 021	·418 144	952 513	·581 856	047 487	4
75	·801 481	076 189	·370 657	947 708	·629 343	052 292	75
6	·877 670	079 253	·318 365	942 830	·681 635	057 170	6
7	·956 923	082 512	·261 195	939 963	·738 805	060 037	7
8	$\bar{4}$·039 435	086 065	·201 158	937 362	·798 842	062 638	8
9	·125 500	090 120	·138 520	935 373	·861 480	064 627	9
80	·215 620	095 082	·073 893	934 499	·926 107	065 501	80
1	·310 702	101 415	·008 392	934 072	·991 608	065 928	1
2	·412 117	108 876	2·942 464	930 108	$\bar{3}$·057 536	069 892	2
3	·520 993	117 155	·872 572	923 059	·127 428	076 941	3
4	·638 148	125 918	·795 631	913 674	·204 369	086 326	4
85	·764 066	134 261	·709 305	901 014	·290 695	098 986	85
6	·898 327	140 923	·610 319	885 762	·389 681	114 238	6
7	$\bar{3}$·039 250	145 067	·496 081	870 940	·503 919	129 060	7
8	·184 317	146 066	·367 021	857 723	·632 979	142 277	8
9	·330 383	144 093	·224 744	848 396	·775 256	151 604	9
90	·474 476	140 822	·073 140	846 497	·926 860	153 503	90
1	·615 298	137 758	1·919 637	850 115	$\bar{2}$·080 363	149 885	1
2	·753 056	141 660	·769 752	873 742	·230 248	126 258	2
3	·894 716	159 364	·643 494	905 880	·356 506	094 120	3
4	$\bar{2}$·054 080	187 406	·549 374	903 527	·450 626	096 473	4
95	·241 486	232 553	·452 901	891 618	·547 099	108 382	95
6	·474 039	311 125	·344 519	864 815	·655 481	135 185	6
7	·785 164	485 721	·209 334	814 440	·790 666	185 560	7
8	$\bar{1}$·270 885		·023 774	692 504	·976 226	307 496	8
9			0·716 278		$\bar{1}$·283 722		9

H^F.

3 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	23·236 8	·294 074	·012 133	55	12·811 3	·597 729	·043 278
1	23·009 3	·300 700	·012 524	6	12·441 2	·608 509	·045 272
2	22·799 8	·306 801	·012 891	7	12·063 6	·619 507	·047 422
3	22·605 1	·312 473	·013 237	8	11·677 6	·630 749	·049 753
4	22·421 0	·317 833	·013 570	9	11·282 7	·642 251	·052 289
15	22·243 3	·323 010	·013 897	60	10·880 2	·653 975	·055 048
6	22·068 4	·328 106	·014 223	1	10·478 4	·665 677	·057 994
7	21·891 8	·333 249	·014 558	2	10·079 4	·677 300	·061 132
8	21·709 1	·338 570	·014 909	3	9·685 9	·688 761	·064 455
9	21·515 7	·344 203	·015 287	4	9·299 5	·700 014	·067 966
20	21·310 5	·350 179	·015 696	65	8·920 9	·711 042	·071 671
1	21·101 9	·356 257	·016 119	6	8·545 3	·721 982	·075 638
2	20·894 5	·362 296	·016 547	7	8·170 1	·732 911	·079 924
3	20·693 2	·368 159	·016 971	8	7·797 0	·743 778	·084 549
4	20·503 7	·373 678	·017 377	9	7·426 8	·754 559	·089 543
25	20·328 8	·378 774	·017 759	70	7·060 6	·765 225	·094 934
6	20·167 5	·383 470	·018 116	1	6·700 9	·775 701	·100 728
7	20·011 6	·388 011	·018 466	2	6·357 7	·785 697	·106 785
8	19·858 4	·392 473	·018 816	3	6·035 1	·795 093	·113 018
9	19·702 9	·397 003	·019 176	4	5·735 3	·803 825	·119 345
30	19·539 5	·401 763	·019 561	75	5·461 5	·811 801	·125 637
1	19·367 0	·406 787	·019 973	6	5·214 8	·818 985	·131 779
2	19·184 3	·412 108	·020 417	7	4·995 0	·825 387	·137 678
3	18·991 1	·417 734	·020 896	8	4·779 2	·831 672	·143 907
4	18·791 6	·423 546	·021 400	9	4·562 6	·837 982	·150 645
35	18·584 9	·429 567	·021 934	80	4·336 3	·844 573	·158 268
6	18·370 2	·435 820	·022 499	1	4·085 8	·851 870	·167 499
7	18·149 2	·442 257	·023 095	2	3·801 8	·860 142	·179 129
8	17·921 5	·448 887	·023 724	3	3·509 8	·868 648	·192 614
9	17·687 0	·455 719	·024 387	4	3·229 4	·876 813	·207 311
40	17·445 2	·462 761	·025 088	85	2·973 2	·884 277	·222 563
1	17·196 9	·469 994	·025 828	6	2·760 4	·890 473	·236 802
2	16·941 5	·477 432	·026 611	7	2·608 8	·894 889	·247 975
3	16·678 5	·485 093	·027 440	8	2·521 5	·897 432	·254 842
4	16·407 7	·492 979	·028 320	9	2·501 3	·898 021	·256 485
45	16·129 2	·501 092	·029 254	90	2·541 6	·896 848	·253 235
6	15·842 4	·509 444	·030 248	1	2·611 0	·894 826	·247 807
7	15·545 4	·518 095	·031 314	2	2·679 0	·892 846	·242 689
8	15·237 2	·527 072	·032 461	3	2·592 9	·895 353	·249 201
9	14·917 2	·536 392	·033 699	4	2·255 7	·905 174	·278 029
50	14·585 4	·546 056	·035 036	95	1·853 2	·916 896	·321 352
1	14·243 3	·556 021	·036 477	6	1·411 9	·929 750	·385 482
2	13·893 3	·566 213	·038 018	7	·955 1	·943 056	·482 362
3	13·537 2	·576 586	·039 663	8	·485 4	·956 735	·644 076
4	13·175 9	·587 110	·041 416	9	·000 0	·970 874	·970 874

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THREE AND A HALF PER-CENT.

HF.

3½ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	70 891·9	1 499 667	28 199 634	17 781·2	563 837·1	10
1	68 279·5	1 431 387	26 699 967	17 566·1	546 055·9	1
2	65 692·6	1 365 695	25 268 580	17 288·2	528 489·8	2
3	63 145·0	1 302 550	23 902 885	16 962·1	511 201·6	3
4	60 650·7	1 241 899	22 600 335	16 603·1	494 239·6	4
15	58 222·5	1 183 677	21 358 436	16 225·9	477 636·4	15
6	55 869·0	1 127 808	20 174 759	15 841·3	461 410·5	6
7	53 599·1	1 074 208	19 046 952	15 460·7	445 569·2	7
8	51 420·5	1 022 788	17 972 743	15 094·6	430 108·6	8
9	49 338·9	973 449·1	16 949 955	14 751·8	415 014·0	9
20	47 351·3	926 097·9	15 976 506	14 432·7	400 262·2	20
1	45 435·4	880 662·5	15 050 408	14 118·0	385 829·5	1
2	43 578·9	837 083·6	14 169 746	13 798·1	371 711·4	2
3	41 771·6	795 312·0	13 332 662	13 464·5	357 913·4	3
4	40 003·0	755 309·0	12 537 350	13 108·4	344 448·9	4
25	38 269·8	717 039·1	11 782 041	12 728·0	331 340·5	25
6	36 575·9	680 463·3	11 065 002	12 328·1	318 612·5	6
7	34 936·9	645 526·4	10 384 539	11 926·0	306 284·4	7
8	33 356·6	612 169·8	9 739 012	11 527·2	294 358·4	8
9	31 841·4	580 328·4	9 126 843	11 140·0	282 831·2	9
30	30 397·0	549 931·5	8 546 514	10 772·3	271 691·2	30
1	29 021·0	520 910·4	7 996 583	10 424·3	260 918·9	1
2	27 711·4	493 199·1	7 475 672	10 096·0	250 494·5	2
3	26 464·5	466 734·6	6 982 473	9 786·27	240 398·5	3
4	25 271·5	441 463·1	6 515 739	9 488·21	230 612·2	4
35	24 130·7	417 332·3	6 074 276	9 202·03	221 124·0	35
6	23 040·5	394 291·8	5 656 943	8 927·85	211 922·0	6
7	21 996·5	372 295·3	5 262 651	8 662·94	202 994·1	7
8	20 996·7	351 298·6	4 890 356	8 406·99	194 331·2	8
9	20 039·4	331 259·2	4 539 058	8 159·70	185 924·2	9
40	19 122·8	312 136·5	4 207 798	7 920·76	177 764·5	40
1	18 244·3	293 892·2	3 895 662	7 688·93	169 843·7	1
2	17 402·6	276 489·6	3 601 770	7 464·24	162 154·8	2
3	16 596·6	259 893·0	3 325 280	7 246·68	154 690·6	3
4	15 824·5	244 068·5	3 065 387	7 035·82	147 443·9	4
45	15 084·8	228 983·8	2 821 319	6 831·24	140 408·1	45
6	14 376·2	214 607·6	2 592 335	6 632·76	133 576·8	6
7	13 698·9	200 908·7	2 377 727	6 441·59	126 944·1	7
8	13 051·9	187 856·9	2 176 818	6 257·84	120 502·5	8
9	12 433·9	175 423·0	1 988 962	6 081·23	114 244·6	9
50	11 843·3	163 579·7	1 813 539	5 911·13	108 163·4	50
1	11 277·4	152 302·3	1 649 959	5 745·74	102 252·3	1
2	10 733·1	141 569·2	1 497 657	5 582·77	96 506·54	2
3	10 208·2	131 361·0	1 356 087	5 420·79	90 923·76	3
4	9 701·14	121 659·9	1 224 726	5 258·98	85 502·97	4

HF.

3½ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
55	9 210·12	112 449·8	1 103 067·	5 096·01	80 243·99	55
6	8 736·11	103 713·7	990 616·8	4 933·46	75 147·98	6
7	8 279·68	95 433·97	886 903·1	4 772·46	70 214·52	7
8	7 840·60	87 593·37	791 469·1	4 613·37	65 442·07	8
9	7 418·33	80 175·04	703 875·8	4 456·24	60 828·70	9
60	7 011·22	73 163·82	623 700·7	4 299·98	56 372·46	60
1	6 613·71	66 550·11	550 536·9	4 139·57	52 072·48	1
2	6 224·75	60 325·36	483 986·8	3 974·27	47 932·91	2
3	5 843·10	54 482·26	423 661·4	3 803·11	43 958·65	3
4	5 468·41	49 013·85	369 179·2	3 626·01	40 155·54	4
65	5 101·16	43 912·70	320 165·3	3 443·68	36 529·53	65
6	4 744·44	39 168·26	276 252·6	3 259·47	33 085·84	6
7	4 399·82	34 768·44	237 084·4	3 075·29	29 826·38	7
8	4 066·54	30 701·90	202 315·9	2 890·79	26 751·09	8
9	3 744·43	26 957·48	171 614·0	2 706·20	23 860·30	9
70	3 433·33	23 524·15	144 656·5	2 521·72	21 154·10	70
1	3 132·65	20 391·50	121 132·4	2 337·14	18 632·38	1
2	2 839·22	17 552·28	100 740·9	2 149·65	16 295·23	2
3	2 553·45	14 998·83	83 188·62	1 959·89	14 145·58	3
4	2 276·94	12 721·90	68 189·79	1 769·73	12 185·69	4
75	2 011·28	10 710·62	55 467·89	1 581·07	10 415·96	75
6	1 758·94	8 951·676	44 757·28	1 396·75	8 834·888	6
7	1 522·64	7 429·037	35 805·60	1 219·92	7 438·143	7
8	1 309·67	6 119·368	28 376·56	1 058·45	6 218·219	8
9	1 119·79	4 999·574	22 257·19	912·859	5 159·774	9
80	952·810	4 046·764	17 257·62	783·742	4 246·915	80
1	808·474	3 238·290	13 210·86	671·627	3 463·172	1
2	684·602	2 553·688	9 972·568	575·094	2 791·545	2
3	574·339	1 979·348	7 418·880	487·983	2 216·451	3
4	474·309	1 505·039	5 439·532	407·375	1 728·468	4
85	383·664	1 121·375	3 934·493	332·769	1 321·094	85
6	301·876	819·499	2 813·117	263·955	988·325	6
7	229·794	589·705	1 993·618	202·082	724·369	7
8	169·412	420·292	1 403·914	149·471	522·288	8
9	121·417	298·876	983·621	107·204	372·817	9
90	85·3376	213·538	684·746	75·2307	265·613	90
1	59·7743	153·764	471·208	52·5532	190·382	1
2	42·2170	111·547	317·444	37·0173	137·829	2
3	31·3263	80·220	205·898	27·5542	100·812	3
4	24·8283	55·392	125·667	22·1156	73·258	4
95	19·5337	35·858	70·285	17·6605	51·142	95
6	14·9366	20·922	34·427	13·7240	33·482	6
7	10·7348	10·187	13·505	10·0273	19·758	7
8	6·8687	3·318	3·318	6·5242	9·730	8
9	3·3182	·000	·000	3·2060	3·206	9

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3½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·850 597	1·983 693	5·149 403	0·016 307	6·175 995	979 762	10
1	·834 290	·983 226	·165 710	·016 774	·155 757	979 597	1
2	·817 516	·982 823	·182 484	·017 177	·135 354	979 440	2
3	·800 339	·982 497	·199 661	·017 503	·114 794	979 292	3
4	·782 836	·982 255	·217 164	·017 745	·094 086	979 147	4
15	·765 091	·982 080	·234 909	·017 920	·073 233	979 002	15
6	·747 171	·981 987	·252 829	·018 013	·052 235	978 854	6
7	·729 158	·981 978	·270 842	·018 022	·031 089	978 697	7
8	·711 136	·982 053	·288 864	·017 947	·009 786	978 527	8
9	·693 189	·982 143	·306 811	·017 857	5·988 313	978 344	9
20	·675 332	·982 062	·324 668	·017 938	·966 657	978 153	20
1	·657 394	·981 883	·342 606	·018 117	·944 810	977 959	1
2	·639 277	·981 605	·360 723	·018 395	·922 769	977 769	2
3	·620 882	·981 211	·379 118	·018 789	·900 538	977 587	3
4	·602 093	·980 764	·397 907	·019 236	·878 125	977 418	4
25	·582 857	·980 337	·417 143	·019 663	·855 543	977 262	25
6	·563 194	·980 090	·436 806	·019 910	·832 805	977 109	6
7	·543 284	·979 898	·456 716	·020 102	·809 914	976 958	7
8	·523 182	·979 810	·476 818	·020 190	·786 872	976 802	8
9	·502 992	·979 838	·497 008	·020 162	·763 674	976 635	9
30	·482 830	·979 883	·517 170	·020 117	·740 309	976 454	30
1	·462 713	·979 945	·537 287	·020 055	·716 763	976 259	1
2	·442 658	·980 006	·557 342	·019 994	·693 022	976 048	2
3	·422 664	·979 967	·577 336	·020 033	·669 070	975 824	3
4	·402 631	·979 940	·597 369	·020 060	·644 894	975 588	4
35	·382 571	·979 922	·617 429	·020 078	·620 482	975 336	35
6	·362 493	·979 860	·637 507	·020 140	·595 818	975 070	6
7	·342 353	·979 798	·657 647	·020 202	·570 888	974 788	7
8	·322 151	·979 733	·677 849	·020 267	·545 676	974 492	8
9	·301 884	·979 667	·698 116	·020 333	·520 168	974 177	9
40	·281 551	·979 576	·718 449	·020 424	·494 345	973 843	40
1	·261 127	·979 488	·738 873	·020 512	·468 188	973 491	1
2	·240 615	·979 403	·759 385	·020 597	·441 679	973 116	2
3	·220 018	·979 311	·779 982	·020 689	·414 795	972 717	3
4	·199 329	·979 210	·800 671	·020 790	·387 512	972 293	4
45	·178 539	·979 104	·821 461	·020 896	·359 805	971 840	45
6	·157 643	·979 041	·842 357	·020 959	·331 645	971 354	6
7	·136 684	·978 988	·863 316	·021 012	·302 999	970 828	7
8	·115 672	·978 935	·884 328	·021 065	·273 827	970 260	8
9	·094 607	·978 866	·905 393	·021 134	·244 087	969 642	9
50	·073 473	·978 737	·926 527	·021 263	·213 729	968 977	50
1	·052 210	·978 515	·947 790	·021 485	·182 706	968 263	1
2	·030 725	·978 222	·969 275	·021 778	·150 969	967 498	2
3	·008 947	·977 876	·991 053	·022 124	·118 467	966 680	3
4	3·986 823	·977 442	$\bar{4}$·013 177	·022 558	·085 147	965 812	4

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3½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	7·824 005	020 238	4·249 961	994 715	5·750 039	005 285	10
1	·844 243	020 403	·244 676	993 073	·755 324	006 927	1
2	·864 646	020 560	·237 749	991 730	·762 251	008 270	2
3	·885 206	020 708	·229 479	990 712	·770 521	009 288	3
4	·905 914	020 853	·220 191	990 018	·779 809	009 982	4
15	·926 767	020 998	·210 209	989 580	·789 791	010 420	15
6	·947 765	021 146	·199 789	989 440	·800 211	010 560	6
7	·968 911	021 303	·189 229	989 592	·810 771	010 408	7
8	·990 214	021 473	·178 821	990 024	·821 179	009 976	8
9	6·011 687	021 656	·168 845	990 502	·831 155	009 498	9
20	·033 343	021 847	·159 347	990 427	·840 653	009 573	20
1	·055 190	022 041	·149 774	990 044	·850 226	009 956	1
2	·077 231	022 231	·139 818	989 371	·860 182	010 629	2
3	·099 462	022 413	·129 189	988 361	·870 811	011 639	3
4	·121 875	022 582	·117 550	987 210	·882 450	012 790	4
25	·144 457	022 738	·104 760	986 138	·895 240	013 862	25
6	·167 195	022 891	·090 898	985 598	·909 102	014 402	6
7	·190 086	023 042	·076 496	985 228	·923 504	014 772	7
8	·213 128	023 198	·061 724	985 161	·938 276	014 839	8
9	·236 326	023 365	·046 885	985 425	·953 115	014 575	9
30	·259 691	023 546	·032 310	985 737	·967 690	014 263	30
1	·283 237	023 741	·018 047	986 104	·981 953	013 896	1
2	·306 978	023 952	·004 151	986 466	·995 849	013 534	2
3	·330 930	024 176	3·990 617	986 567	4·009 383	013 433	3
4	·355 106	024 412	·977 184	986 700	·022 816	013 300	4
35	·379 518	024 664	·963 884	986 863	·036 116	013 137	35
6	·404 182	024 930	·950 747	986 919	·049 253	013 081	6
7	·429 112	025 212	·937 666	986 975	·062 334	013 025	7
8	·454 324	025 508	·924 641	987 033	·075 359	012 967	8
9	·479 832	025 823	·911 674	987 093	·088 326	012 907	9
40	·505 655	026 157	·898 767	987 099	·101 233	012 901	40
1	·531 812	026 509	·885 866	987 119	·114 134	012 881	1
2	·558 321	026 884	·872 985	987 154	·127 015	012 846	2
3	·585 205	027 283	·860 139	987 176	·139 861	012 824	3
4	·612 488	027 707	·847 315	987 185	·152 685	012 815	4
45	·640 195	028 160	·834 500	987 195	·165 500	012 805	45
6	·668 355	028 646	·821 695	987 298	·178 305	012 702	6
7	·697 001	029 172	·808 993	987 431	·191 007	012 569	7
8	·726 173	029 740	·796 424	987 567	·203 576	012 433	8
9	·755 913	030 358	·783 991	987 679	·216 009	012 321	9
50	·786 271	031 023	·771 670	987 676	·228 330	012 324	50
1	·817 294	031 737	·759 346	987 504	·240 654	012 496	1
2	·849 031	032 502	·746 850	987 213	·253 150	012 787	2
3	·881 533	033 320	·734 063	986 839	·265 937	013 161	3
4	·914 853	034 188	·720 902	986 329	·279 098	013 671	4

H^F.

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·964 265	$\bar{1}$·977 053	4·035 735	0·022 947	5·050 959	964 877	55
6	·941 318	·976 696	·058 682	·023 304	·015 836	963 867	6
7	·918 014	·976 335	·081 986	·023 665	4·979 703	962 768	7
8	·894 349	·975 957	·105 651	·024 043	·942 471	961 568	8
9	·870 306	·975 487	·129 694	·024 513	·904 039	960 257	9
60	·845 793	·974 652	·154 207	·025 348	·864 296	958 853	60
1	·820 445	·973 677	·179 555	·026 323	·823 149	957 351	1
2	·794 122	·972 521	·205 878	·027 479	·780 500	955 755	2
3	·766 643	·971 218	·233 357	·028 782	·736 255	954 064	3
4	·737 861	·969 808	·262 139	·030 192	·690 319	952 271	4
65	·707 669	·968 516	·292 331	·031 484	·642 590	950 344	65
6	·676 185	·967 250	·323 815	·032 750	·592 934	948 251	6
7	·643 435	·965 790	·356 565	·034 210	·541 185	945 980	7
8	·609 225	·964 160	·390 775	·035 840	·487 165	943 514	8
9	·573 385	·962 331	·426 615	·037 669	·430 679	940 835	9
70	·535 716	·960 196	·464 284	·039 804	·371 514	937 935	70
1	·495 912	·957 287	·504 088	·042 713	·309 449	934 885	1
2	·453 199	·953 928	·546 801	·046 072	·244 334	931 724	2
3	·407 127	·950 224	·592 873	·049 776	·176 058	928 494	3
4	·357 351	·946 122	·642 649	·053 878	·104 552	925 262	4
75	·303 473	·941 778	·696 527	·058 222	·029 814	922 090	75
6	·245 251	·937 346	·754 749	·062 654	3·951 904	919 029	6
7	·182 597	·934 565	·817 403	·065 435	·870 933	915 774	7
8	·117 162	·931 976	·882 838	·068 024	·786 707	912 226	8
9	·049 138	·929 868	·950 862	·070 132	·698 933	908 175	9
80	2·979 006	·928 660	5·020 994	·071 340	·607 108	903 208	80
1	·907 666	·927 772	·092 334	·072 228	·510 316	896 852	1
2	·835 438	·923 731	·164 562	·076 269	·407 168	889 354	2
3	·759 169	·916 892	·240 831	·083 108	·296 522	881 026	3
4	·676 061	·907 890	·323 939	·092 110	·177 548	872 203	4
85	·583 951	·895 878	·416 049	·104 122	·049 751	863 798	85
6	·479 829	·881 511	·520 171	·118 489	2·913 549	857 086	6
7	·361 340	·867 605	·638 660	·132 395	·770 635	852 917	7
8	·228 945	·855 334	·771 055	·144 666	·623 552	851 938	8
9	·084 279	·846 861	·915 721	·153 139	·475 490	853 985	9
90	1·931 140	·845 374	6·068 860	·154 626	·329 475	857 379	90
1	·776 514	·848 974	·223 486	·151 026	·186 854	860 603	1
2	·625 488	·870 421	·374 512	·129 579	·047 457	856 828	2
3	·495 909	·899 039	·504 091	·100 961	1·904 285	839 162	3
4	·394 948	·895 836	·605 052	·104 164	·743 447	811 143	4
95	·290 784	·883 468	·709 216	·116 532	·554 590	766 007	95
6	·174 252	·856 541	·825 748	·143 459	·320 597	687 447	6
7	·030 793	·806 083	·969 207	·193 917	·008 044	512 861	7
8	0·836 876	·684 029	7·163 124	·315 971	0·520 905		8
9	·520 905		·479 095				9

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3½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{6}$·949 041	035 123	3·707 231	985 920	$\bar{4}$·292 769	014 080	55
6	·984 164	036 133	·693 151	985 591	·306 849	014 409	6
7	$\bar{5}$·020 297	037 232	·678 742	985 276	·321 258	014 724	7
8	·057 529	038 432	·664 018	984 950	·335 982	015 050	8
9	·095 961	039 743	·648 968	984 499	·351 032	015 501	9
60	·135 704	041 147	·633 467	983 488	·366 533	016 512	60
1	·176 851	042 649	·616 955	982 302	·383 045	017 698	1
2	·219 500	044 245	·599 257	980 882	·400 743	019 118	2
3	·263 745	045 936	·580 139	979 290	·419 861	020 710	3
4	·309 681	047 729	·559 429	977 594	·440 571	022 406	4
65	·357 410	049 656	·537 023	976 123	·462 977	023 877	65
6	·407 066	051 749	·513 146	974 740	·486 854	025 260	6
7	·458 815	054 020	·487 886	973 131	·512 114	026 869	7
8	·512 835	056 486	·461 017	971 342	·538 983	028 658	8
9	·569 321	059 165	·432 359	969 339	·567 641	030 661	9
70	·628 486	062 065	·401 698	966 988	·598 302	033 012	70
1	·690 551	065 115	·368 686	963 682	·631 314	036 318	1
2	·755 666	068 276	·332 368	959 864	·667 632	040 136	2
3	·823 942	071 506	·292 232	955 675	·707 768	044 325	3
4	·895 448	074 738	·247 907	951 045	·752 093	048 955	4
75	·970 186	077 910	·198 952	946 165	·801 048	053 835	75
6	$\bar{4}$·048 096	080 971	·145 117	941 216	·854 883	058 784	6
7	·129 067	084 226	·086 333	938 335	·913 667	061 665	7
8	·213 293	087 774	·024 668	935 736	·975 332	064 264	8
9	·301 067	091 825	2·960 404	933 769	$\bar{3}$·039 596	066 231	9
80	·392 892	096 792	·894 173	932 955	·105 827	067 045	80
1	·489 684	103 148	·827 128	932 611	·172 872	067 389	1
2	·592 832	110 646	·759 739	928 665	·240 261	071 335	2
3	·703 478	118 974	·688 404	921 590	·311 596	078 410	3
4	·822 452	127 797	·609 994	912 149	·390 006	087 851	4
85	·950 249	136 202	·522 143	899 388	·477 857	100 612	85
6	$\bar{3}$·086 451	142 914	·421 531	883 996	·578 469	116 004	6
7	·229 365	147 083	·305 527	869 029	·694 473	130 971	7
8	·376 448	148 062	·174 556	855 655	·825 444	144 345	8
9	·524 510	146 015	·030 211	846 184	·969 789	153 816	9
90	·670 525	142 621	1·876 395	844 204	$\bar{2}$·123 605	155 796	90
1	·813 146	139 397	·720 599	847 806	·279 401	152 194	1
2	·952 543	143 172	·568 405	871 782	·431 595	128 218	2
3	$\bar{2}$·095 715	160 838	·440 187	904 511	·559 813	095 489	3
4	·256 553	188 857	·344 698	902 306	·655 302	097 694	4
95	·445 410	233 993	·247 004	890 478	·752 996	109 522	95
6	·679 403	312 553	·137 482	863 701	·862 518	136 299	6
7	·991 956	487 139	·001 183	813 347	·998 817	186 653	7
8	$\bar{1}$·479 095		0·814 530	691 435	$\bar{1}$·185 470	308 565	8
9			·505 965		·494 035		9

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$3\frac{1}{2}$ PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	21·1543	·250 821	·011 322	55	12·2094	·553 306	·041 887
1	20·9636	·257 268	·011 713	6	11·8718	·564 720	·043 873
2	20·7892	·263 168	·012 078	7	11·5263	·576 406	·046 016
3	20·6279	·268 621	·012 420	8	11·1718	·588 394	·048 341
4	20·4762	·273 750	·012 747	9	10·8077	·600 706	·050 874
15	20·3302	·278 688	·013 065	60	10·4353	·613 300	·053 632
6	20·1867	·283 543	·013 383	1	10.0624	·625 907	·056 579
7	20·0415	·288 450	·013 709	2	9·6912	·638 462	·059 718
8	19·8907	·293 552	·014 052	3	9·3242	·650 872	·063 043
9	19·7299	·298 990	·014 423	4	8·9631	·663 084	·066 554
20	19·5580	·304 800	·014 826	65	8·6084	·675 079	·070 259
1	19·3828	·310 728	·015 245	6	8·2556	·687 008	·074 226
2	19·2084	·316 623	·015 668	7	7·9022	·698 958	·078 515
3	19·0395	·322 335	·016 085	8	7·5499	·710 873	·083 144
4	18·8813	·327 685	·016 482	9	7·1994	·722 727	·088 144
25	18·7364	·332 585	·016 851	70	6·8517	·734 483	·093 545
6	18·6042	·337 057	·017 193	1	6·5093	·746 060	·099 351
7	18·4769	·341 359	·017 526	2	6·1821	·757 128	·105 419
8	18·3523	·345 575	·017 857	3	5·8740	·767 547	·111 660
9	18·2256	·349 859	·018 198	4	5·5873	·777 241	·117 991
30	18·0917	·354 388	·018 562	75	5·3253	·786 102	·124 280
1	17·9494	·359 199	·018 956	6	5·0892	·794 083	·130 408
2	17·7977	·364 328	·019 382	7	4·8791	·801 191	·136 279
3	17·6362	·369 789	·019 842	8	4·6725	·808 178	·142 474
4	17·4688	·375 451	·020 329	9	4·4647	·815 202	·149 175
35	17·2946	·381 341	·020 844	80	4·2472	·822 559	·156 762
6	17·1130	·387 485	·021 393	1	4·0054	·830 734	·165 966
7	16·9252	·393 833	·021 971	2	3·7302	·840 042	·177 592
8	16·7311	·400 396	·022 582	3	3·4463	·849 642	·191 089
9	16·5304	·407 183	·023 227	4	3·1731	·858 880	·205 812
40	16·3228	·414 206	·023 911	85	2·9228	·867 345	·221 103
1	16·1087	·421 444	·024 633	6	2·7147	·874 383	·235 385
2	15·8878	·428 914	·025 398	7	2·5662	·879 403	·246 592
3	15·6594	·436 637	·026 210	8	2·4809	·882 289	·253 467
4	15·4235	·444 617	·027 072	9	2·4616	·882 942	·255 070
45	15·1798	·452 857	·027 989	90	2·5023	·881 566	·251 712
6	14·9280	·461 372	·028 966	1	2·5724	·879 194	·246 107
7	14·6661	·470 228	·030 016	2	2·6422	·876 833	·240 742
8	14·3931	·479 460	·031 148	3	2·5608	·879 587	·247 019
9	14·1085	·489 085	·032 372	4	2·2310	·890 739	·275 685
50	13·8120	·499 111	·033 696	95	1·8357	·904 106	·318 828
1	13·5051	·509 490	·035 125	6	1·4007	·918 817	·382 729
2	13·1900	·520 146	·036 656	7	·9490	·934 093	·479 276
3	12·8682	·531 025	·038 291	8	·4831	·949 847	·640 451
4	12·5408	·542 099	.040 035	9	·0000	·966 184	·966 184

HF.

FOUR PER-CENT.

H^F.

4 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	67 556·4	1 308 776	23 182 517	14 620·6	431 760·9	10
1	64 754·1	1 244 021	21 873 741	14 416·6	417 140·3	1
2	62 001·2	1 182 020	20 629 720	14 154·3	402 723·7	2
3	59 310·3	1 122 710	19 447 700	13 848·0	388 569·4	3
4	56 693·6	1 066 016	18 324 990	13 512·5	374 721·5	4
15	54 162·2	1 011 854	17 258 973	13 161·5	361 209·0	15
6	51 722·9	960 131·2	16 247 119	12 805·4	348 047·5	6
7	49 382·9	910 748·3	15 286 988	12 454·8	335 242·0	7
8	47 147·9	863 600·4	14 376 240	12 119·1	322 787·2	8
9	45 021·7	818 578·7	13 512 639	11 806·3	310 668·1	9
20	43 000·3	775 578·4	12 694 061	11 516·5	298 861·8	20
1	41 062·1	734 516·3	11 918 482	11 232·2	287 345·3	1
2	39 195·0	695 321·3	11 183 966	10 944·4	276 113·1	2
3	37 388·9	657 932·4	10 488 645	10 645·8	265 168·7	3
4	35 633·7	622 298·7	9 830 712	10 328·6	254 522·9	4
25	33 925·9	588 372·7	9 208 414	9 991·38	244 194·3	25
6	32 268·4	556 104·4	8 620 041	9 638·62	234 202·9	6
7	30 674·2	525 430·2	8 063 937	9 285·56	224 564·3	7
8	29 145·9	496 284·2	7 538 507	8 937·08	215 278·7	8
9	27 688·3	468 596·0	7 042 222	8 600·40	206 341·7	9
30	26 305·1	442 290·9	6 573 626	8 282·21	197 741·3	30
1	24 993·7	417 297·2	6 131 335	7 982·49	189 459·1	1
2	23 751·0	393 546·2	5 714 038	7 701·14	181 476·6	2
3	22 573·3	370 972·9	5 320 492	7 436·91	173 775·4	3
4	21 452·1	349 520·8	4 949 519	7 183·90	166 338·5	4
35	20 385·3	329 135·5	4 599 998	6 942·14	159 154·6	35
6	19 370·7	309 764·8	4 270 863	6 711·63	152 212·5	6
7	18 404·0	291 360·8	3 961 098	6 489·99	145 500·9	7
8	17 483·1	273 877·8	3 669 737	6 276·87	139 010·9	8
9	16 605·7	257 272·1	3 395 860	6 071·94	132 734·0	9
40	15 770·0	241 502·1	3 138 588	5 874·90	126 662·1	40
1	14 973·2	226 528·9	2 897 085	5 684·64	120 787·2	1
2	14 213·8	212 315·1	2 670 557	5 501·11	115 102·5	2
3	13 490·3	198 824·9	2 458 241	5 324·28	109 601·4	3
4	12 800·8	186 024·1	2 259 417	5 153·71	104 277·1	4
45	12 143·8	173 880·3	2 073 392	4 989·02	99 123·41	45
6	11 517·7	162 362·6	1 899 512	4 830·00	94 134·40	6
7	10 922·3	151 440·3	1 737 150	4 677·57	89 304·40	7
8	10 356·4	141 083·9	1 585 709	4 531·77	84 626·82	8
9	9 818·61	131 265·3	1 444 625	4 392·31	80 095·05	9
50	9 307·30	121 958·0	1 313 360	4 258·63	75 702·74	50
1	8 819·98	113 138·0	1 191 402	4 129·28	71 444·11	1
2	8 353·90	104 784·1	1 078 264	4 002·44	67 314·83	2
3	7 907·13	96 876·96	973 480·2	3 876·97	63 312·39	3
4	7 478·28	89 398·69	876 603·2	3 752·24	59 435·42	4

Hf.

4 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	7 065·63	82 333·06	787 204·5	3 627·22	55 683·18	55
6	6 669·77	75 663·30	704 871·5	3 503·11	52 055·96	6
7	6 290·91	69 372·39	629 208·2	3 380·78	48 552·85	7
8	5 928·65	63 443·74	559 835·8	3 260·48	45 172·07	8
9	5 582·39	57 861·35	496 392·0	3 142·24	41 911·59	9
60	5 250·66	52 610·69	438 530·7	3 025·22	38 769·35	60
1	4 929·16	47 681·53	385 920·0	2 905·67	35 744·12	1
2	4 616·97	43 064·56	338 238·5	2 783·06	32 838·45	2
3	4 313·05	38 751·51	295 173·9	2 656·72	30 055·39	3
4	4 017·07	34 734·44	256 422·4	2 526·63	27 398·67	4
65	3 729·27	31 005·16	221 688·0	2 393·33	24 872·04	65
6	3 451·81	27 553·35	190 682·8	2 259·31	22 478·70	6
7	3 185·70	24 367·65	163 129·5	2 125·96	20 219·40	7
8	2 930·23	21 437·42	138 761·8	1 993·01	18 093·44	8
9	2 685·15	18 752·27	117 324·4	1 860·64	16 100·43	9
70	2 450·23	16 302·05	98 572·11	1 728·99	14 239·80	70
1	2 224·89	14 077·15	82 270·07	1 597·89	12 510·81	1
2	2 006·80	12 070·36	68 192·92	1 465·37	10 912·92	2
3	1 796·13	10 274·22	56 122·56	1 331·89	9 447·551	3
4	1 593·93	8 680·290	45 848·34	1 198·77	8 115·662	4
75	1 401·20	7 279·095	37 168·05	1 067·34	6 916·893	75
6	1 219·51	6 059·589	29 888·96	939·541	5 849·555	6
7	1 050·60	5 008·991	23 829·37	817·537	4 910·014	7
8	899·308	4 109·684	18 820·38	706·654	4 092·477	8
9	765·230	3 344·454	14 710·69	607·165	3 385·823	9
80	647·988	2 696·465	11 366·24	519·355	2 778·658	80
1	547·185	2 149·281	8 669·773	443·475	2 259·302	1
2	461·119	1 688·162	6 520·493	378·454	1 815·828	2
3	384·991	1 303·171	4 832·331	320·062	1 437·373	3
4	316·410	986·761	3 529·161	266·288	1 117·312	4
85	254·711	732·050	2 542·400	216·758	851·024	85
6	199·449	532·601	1 810·350	171·293	634·265	6
7	151·095	381·506	1 277·749	130·610	462·972	7
8	110·857	270·650	896·243	96·183 4	332·362	8
9	79·068 4	191·581	625·593	68·658 8	236·179	9
90	55·305 9	136·275	434·012	47·937 4	167·520	90
1	38·552 5	97·723	297·737	33·311 1	119·583	1
2	27·097 7	70·625	200·014	23·339 1	86·271	2
3	20·010 6	50·615	129·389	17·294 3	62·932	3
4	15·783 6	34·831	78·774	13·836 9	45·638	4
95	12·358 1	22·473	43·943	11·018 4	31·801	95
6	9·404 3	13·069	21·470	8·539 9	20·783	6
7	6·726 3	6·342	8·402	6·223 6	12·243	7
8	4·283 1	2·059	2·059	4·039 2	6·019	8
9	2·059 2	·000	·000	1·980 0	1·980	9

H^F.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	4·829 667	$\bar{1}$·981 601	5·170 333	0·018 399	6·116 865	977 963	10
1	·811 268	·981 132	·188 732	·018 868	·094 828	977 797	1
2	·792 400	·980 730	·207 600	·019 270	·072 625	977 643	2
3	·773 130	·980 404	·226 870	·019 596	·050 268	977 496	3
4	·753 534	·980 162	·246 466	·019 838	·027 764	977 354	4
15	·733 696	·979 987	·266 304	·020 013	·005 118	977 213	15
6	·713 683	·979 894	·286 317	·020 106	5·982 331	977 067	6
7	·693 577	·979 885	·306 423	·020 115	·959 398	976 915	7
8	·673 462	·979 960	·326 538	·020 040	·936 313	976 747	8
9	·653 422	·980 050	·346 578	·019 950	·913 060	976 566	9
20	·633 472	·979 969	·366 528	·020 031	·889 626	976 375	20
1	·613 441	·979 790	·386 559	·020 210	·866 001	976 185	1
2	·593 231	·979 512	·406 769	·020 488	·842 186	975 995	2
3	·572 743	·979 118	·427 257	·020 882	·818 181	975 818	3
4	·551 861	·978 671	·448 139	·021 329	·793 999	975 654	4
25	·530 532	·978 245	·469 468	·021 755	·769 653	975 503	25
6	·508 777	·977 996	·491 223	·022 004	·745 156	975 359	6
7	·486 773	·977 805	·513 227	·022 195	·720 515	975 216	7
8	·464 578	·977 718	·535 422	·022 282	·695 731	975 068	8
9	·442 296	·977 745	·557 704	·022 255	·670 799	974 909	9
30	·420 041	·977 789	·579 959	·022 211	·645 708	974 738	30
1	·397 830	·977 852	·602 170	·022 148	·620 446	974 550	1
2	·375 682	·977 913	·624 318	·022 087	·594 996	974 346	2
3	·353 595	·977 875	·646 405	.022 125	·569 342	974 131	3
4	·331 470	·977 846	·668 530	·022 154	·543 473	973 902	4
35	·309 316	·977 829	·690 684	·022 171	·517 375	973 657	35
6	·287 145	·977 768	·712 855	·022 232	·491 032	973 399	6
7	·264 913	·977 704	·735 087	·022 296	·464 431	973 126	7
8	·242 617	·977 640	·757 383	·022 360	·437 557	972 836	8
9	·220 257	·977 574	·779 743	·022 426	·410 393	972 528	9
40	·197 831	·977 483	·802 169	·022 517	·382 921	972 203	40
1	·175 314	·977 395	·824 686	·022 605	·355 124	971 857	1
2	·152 709	·977 311	·847 291	·022 689	·326 981	971 490	2
3	·130 020	·977 218	·869 980	·022 782	·298 471	971 098	3
4	·107 238	·977 116	·892 762	·022 884	·269 569	970 681	4
45	·084 354	·977 012	·915 646	·022 988	·240 250	970 236	45
6	·061 366	·976 948	·938 634	·023 052	·210 486	969 755	6
7	·038 314	·976 895	·961 686	·023 105	·180 241	969 236	7
8	·015 209	·976 841	·984 791	·023 159	·149 477	968 673	8
9	3·992 050	·976 774	$\bar{4}$·007 950	·023 226	·118 150	968 060	9
50	·968 824	·976 643	·031 176	·023 357	·086 210	967 399	50
1	·945 467	·976 422	·054 533	·023 578	·053 609	966 686	1
2	·921 889	·976 130	·078 111	·023 870	·020 295	965 926	2
3	·898 019	·975 783	·101 981	·024 217	4·986 221	965 110	3
4	·873 802	·975 349	·126 198	·024 651	·951 331	964 243	4

HF.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·883 135	022 037	4·164 964	993 899	$\bar{5}$·835 036	006 101	10
1	·905 172	022 203	·158 863	992 025	·841 137	007 975	1
2	·927 375	022 357	·150 888	990 499	·849 112	009 501	2
3	·949 732	022 504	·141 387	989 348	·858 613	010 652	3
4	·972 236	022 646	·130 735	988 572	·869 265	011 428	4
15	·994 882	022 787	·119 307	988 087	·880 693	011 913	15
6	$\bar{6}$·017 669	022 933	·107 394	987 943	·892 606	012 057	6
7	·040 602	023 085	·095 337	988 134	·904 663	011 866	7
8	·063 687	023 253	·083 471	988 644	·916 529	011 356	8
9	·086 940	023 434	·072 115	989 207	·927 885	010 793	9
20	·110 374	023 625	·061 322	989 142	·938 678	010 858	20
1	·133 999	023 815	·050 464	988 728	·949 536	011 272	1
2	·157 814	024 005	·039 192	987 985	·960 808	012 015	2
3	·181 819	024 182	·027 177	986 865	·972 823	013 135	3
4	·206 001	024 346	·014 042	985 583	·985 958	014 417	4
25	·230 347	024 497	3·999 625	984 390	$\bar{4}$·000 375	015 610	25
6	·254 844	024 641	·984 015	983 793	·015 985	016 207	6
7	·279 485	024 784	·967 808	983 388	·032 192	016 612	7
8	·304 269	024 932	·951 196	983 323	·048 804	016 677	8
9	·329 201	025 091	·934 519	983 627	·065 481	016 373	9
30	·354 292	025 262	·918 146	983 992	·081 854	016 008	30
1	·379 554	025 450	·902 138	984 417	·097 862	015 583	1
2	·405 004	025 654	·886 555	984 838	·113 445	015 162	2
3	·430 658	025 869	·871 393	984 967	·128 607	015 033	3
4	·456 527	026 098	·856 360	985 134	·143 640	014 866	4
35	·482 625	026 343	·841 494	985 334	·158 506	014 666	35
6	·508 968	026 601	·826 828	985 416	·173 172	014 584	6
7	·535 569	026 874	·812 244	985 499	·187 756	014 501	7
8	·562 443	027 164	·797 743	985 585	·202 257	014 415	8
9	·589 607	027 472	·783 328	985 673	·216 672	014 327	9
40	·617 079	027 797	·769 001	985 702	·230 999	014 298	40
1	·644 876	028 143	·754 703	985 748	·245 297	014 252	1
2	·673 019	028 510	·740 451	985 810	·259 549	014 190	2
3	·701 529	028 902	·726 261	985 859	·273 739	014 141	3
4	·730 431	029 319	·712 120	985 895	·287 880	014 105	4
45	·759 750	029 764	·698 015	985 932	·301 985	014 068	45
6	·789 514	030 245	·683 947	986 074	·316 053	013 926	6
7	·819 759	030 764	·670 021	986 247	·329 979	013 753	7
8	·850 523	031 327	·656 268	986 425	·343 732	013 575	8
9	·881 850	031 940	·642 693	986 577	·357 307	013 423	9
50	·913 790	032 601	·629 270	986 605	·370 730	013 395	50
1	·946 391	033 314	·615 875	986 450	·384 125	013 550	1
2	·979 705	034 074	·602 325	986 168	·397 675	013 832	2
3	$\bar{5}$·013 779	034 890	·588 493	985 798	·411 507	014 202	3
4	·048 669	035 757	·574 291	985 282	·425 709	014 718	4

H^F.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
55	3·849 151	$\bar{1}$·974 960	$\bar{4}$·150 849	0·025 040	4·915 574	963 311	55
6	·824 111	·974 602	·175 889	·025 398	·878 885	962 302	6
7	·798 713	·974 243	·201 287	·025 757	·841 187	961 202	7
8	·772 956	·973 864	·227 044	·026 136	·802 389	960 000	8
9	·746 820	·973 394	·253 180	·026 606	·762 389	958 685	9
60	·720 214	·972 559	·279 786	·027 441	·721 074	957 276	60
1	·692 773	·971 584	·307 227	·028 416	·678 350	955 770	1
2	·664 357	·970 428	·335 643	·029 572	·634 120	954 169	2
3	·634 785	·969 125	·365 215	·030 875	·588 289	952 471	3
4	·603 910	·967 714	·396 090	·032 286	·540 760	950 674	4
65	·571 624	·966 423	·428 376	·033 577	·491 434	948 740	65
6	·538 047	·965 158	·461 953	·034 842	·440 174	946 640	6
7	·503 205	·963 696	·496 795	·036 304	·386 814	944 359	7
8	·466 901	·962 068	·533 099	·037 932	·331 173	941 881	8
9	·428 969	·960 237	·571 031	·039 763	·273 054	939 188	9
70	·389 206	·958 103	·610 794	·041 897	·212 242	936 273	70
1	·347 309	·955 195	·652 691	·044 805	·148 515	933 205	1
2	·302 504	·951 835	·697 496	·048 165	·081 720	930 029	2
3	·254 339	·948 131	·745 661	·051 869	·011 749	926 785	3
4	·202 470	·944 029	·797 530	·055 971	3·938 534	923 543	4
75	·146 499	·939 685	·853 501	·060 315	·862 077	920 366	75
6	·086 184	·935 253	·913 816	·064 747	·782 443	917 307	6
7	·021 437	·932 471	·978 563	·067 529	·699 750	914 058	7
8	2·953 908	·929 884	$\bar{3}$·046 092	·070 116	·613 808	910 517	8
9	·883 792	·927 775	·116 208	·072 225	·524 325	906 470	9
80	·811 567	·926 567	·188 433	·073 433	·430 795	901 498	80
1	·738 134	·925 679	·261 866	·074 321	·332 293	895 121	1
2	·663 813	·921 637	·336 187	·078 363	·227 414	887 587	2
3	·585 450	·914 800	·414 550	·085 200	·115 001	879 211	3
4	·500 250	·905 797	·499 750	·094 203	2·994 212	870 329	4
85	·406 047	·893 785	·593 953	·106 215	·864 541	861 861	85
6	·299 832	·879 417	·700 168	·120 583	·726 402	855 100	6
7	·179 249	·865 513	·820 751	·134 487	·581 502	850 905	7
8	·044 762	·853 241	·955 238	·146 759	·432 407	849 946	8
9	1·898 003	·844 768	2·101 997	·155 232	·282 353	852 064	9
90	·742 771	·843 281	·257 229	·156 719	·134 417	855 579	90
1	·586 052	·846 881	·413 948	·153 119	1·989 996	858 964	1
2	·432 933	·868 328	·567 067	·131 672	·848 960	855 315	2
3	·301 261	·896 946	·698 739	·103 054	·704 275	837 690	3
4	·198 207	·893 743	·801 793	·106 257	·541 965	809 694	4
95	·091 950	·881 375	·908 050	·118 625	·351 659	764 570	95
6	0·973 325	·854 448	$\bar{1}$·026 675	·145 552	·116 229	686 021	6
7	·827 773	·803 990	·172 227	·196 010	0·802 250	511 449	7
8	·631 763	·681 936	·368 237	·318 064	·313 699		8
9	·313 699		·686 301				9

HF.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·084 426	036 689	3·559 573	984 881	$\bar{4}$·440 427	015 119	55
6	·121 115	037 698	·544 454	984 563	·455 546	015 437	6
7	·158 813	038 798	·529 017	984 265	·470 983	015 735	7
8	·197 611	040 000	·513 282	983 958	·486 718	016 042	8
9	·237 611	041 315	·497 240	983 518	·502 760	016 482	9
60	·278 926	042 724	·480 758	982 488	·519 242	017 512	60
1	·321 650	044 230	·463 246	981 277	·536 754	018 723	1
2	·365 880	045 831	·444 523	979 823	·555 477	020 177	2
3	·411 711	047 529	·424 346	978 196	·575 654	021 804	3
4	·459 240	049 326	·402 542	976 461	·597 458	023 539	4
65	·508 566	051 260	·379 003	974 972	·620 997	025 028	65
6	·559 826	053 360	·353 975	973 579	·646 025	026 421	6
7	·613 186	055 641	·327 554	971 955	·672 446	028 045	7
8	·668 827	058 119	·299 509	970 152	·700 491	029 848	8
9	·726 946	060 812	·269 661	968 130	·730 339	031 870	9
70	·787 758	063 727	·237 791	965 756	·762 209	034 244	70
1	·851 485	066 795	·203 547	962 400	·796 453	037 600	1
2	·918 280	069 971	·165 947	958 521	·834 053	041 479	2
3	·988 251	073 215	·124 468	954 268	·875 532	045 732	3
4	$\bar{4}$·061 466	076 457	·078 736	949 566	·921 264	050 434	4
75	·137 923	079 634	·028 302	944 614	·971 698	055 386	75
6	·217 557	082 693	2·972 916	939 591	$\bar{3}$·027 084	060 409	6
7	·300 250	085 942	·912 507	936 700	·087 493	063 300	7
8	·386 192	089 483	·849 207	934 100	·150 793	065 900	8
9	·475 675	093 530	·783 307	932 158	·216 693	067 842	9
80	·569 205	098 502	·715 465	931 404	·284 535	068 596	80
1	·667 707	104 879	·646 869	931 144	·353 131	068 856	1
2	·772 586	112 413	·578 013	927 221	·421 987	072 779	2
3	·884 999	120 789	·505 234	920 118	·494 766	079 882	3
4	$\bar{3}$·005 788	129 671	·425 352	910 623	·574 648	089 377	4
85	·135 459	138 139	·335 975	897 765	·664 025	102 235	85
6	·273 598	144 900	·233 740	882 237	·766 260	117 763	6
7	·418 498	149 095	·115 977	867 123	·884 023	132 877	7
8	·567 593	150 054	1·983 100	853 596	$\bar{2}$·016 900	146 404	8
9	·717 647	147 936	·836 696	843 978	·163 304	156 022	9
90	·865 583	144 421	·680 674	841 915	·319 326	158 085	90
1	$\bar{2}$·010 004	141 036	·522 589	845 496	·477 411	154 504	1
2	·151 040	144 685	·368 085	869 817	·631 915	130 183	2
3	·295 725	162 310	·237 902	903 137	·762 098	096 863	3
4	·458 035	190 306	·141 039	901 080	·858 961	098 920	4
95	·648 341	235 430	·042 119	889 336	·957 881	110 664	95
6	·883 771	313 979	0·931 455	862 588	$\bar{1}$·068 545	137 412	6
7	$\bar{1}$·197 750	488 551	·794 043	812 253	·205 957	187 747	7
8	·686 301		·606 296	690 370	·393 704	309 630	8
9			·296 666		·703 334		9

H^F.

4 PER CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	19·3731	·216420	·010623	55	11·6526	·513361	·040573
1	19·2115	·222636	·011015	6	11·3442	·525222	·042548
2	19·0645	·228290	·011378	7	11·0274	·537408	·044682
3	18·9294	·233484	·011716	8	10·7012	·549954	·047000
4	18·8031	·238342	·012036	9	10·3650	·562885	·049528
15	18·6819	·243003	·012346	60	10·0198	·576161	·052284
6	18·5630	·247577	·012655	1	9·6734	·589486	·055230
7	18·4426	·252209	·012972	2	9·3275	·602790	·058368
8	18·3168	·257045	·013307	3	8·9847	·615973	·061692
9	18·1819	·262236	·013671	4	8·6467	·628973	·065201
20	18·0366	·267824	·014069	65	8·3140	·641770	·068904
1	17·8879	·273541	·014482	6	7·9823	·654517	·072869
2	17·7400	·279229	·014900	7	7·6491	·667343	·077158
3	17·5970	·284731	·015311	8	7·3160	·680155	·081789
4	17·4638	·289855	·015699	9	6·9837	·692935	·086794
25	17·3429	·294506	·016056	70	6·6533	·705643	·092201
6	17·2337	·298702	·016382	1	6·3271	·718188	·098018
7	17·1294	·302716	·016698	2	6·0147	·730202	·104095
8	17·0276	·306632	·017009	3	5·7202	·741531	·110344
9	16·9240	·310615	·017330	4	5·4458	·752083	·116677
30	16·8139	·314852	·017675	75	5·1949	·761734	·122961
1	16·6961	·319380	·018048	6	4·9689	·770427	·129074
2	16·5696	·324244	·018455	7	4·7678	·778163	·134916
3	16·4341	·329456	·018897	8	4·5698	·785776	·141077
4	16·2931	·334881	·019365	9	4·3705	·793442	·147740
35	16·1458	·340547	·019862	80	4·1613	·801489	·155289
6	15·9914	·346484	·020392	1	3·9279	·810466	·164465
7	15·8314	·352640	·020951	2	3·6610	·820730	·176084
8	15·6653	·359026	·021543	3	3·3849	·831348	·189592
9	15·4930	·365654	·022170	4	3·1186	·841592	·204339
40	15·3140	·372537	·022835	85	2·8740	·850998	·219666
1	15·1290	·379655	·023539	6	2·6704	·858832	·233991
2	14·9373	·387027	·024284	7	2·5249	·864425	·245231
3	14·7384	·394676	·025077	8	2·4414	·867637	·252115
4	14·5322	·402608	·025921	9	2·4230	·868347	·253681
45	14·3185	·410829	·026819	90	2·4640	·866768	·250220
6	14·0968	·419354	·027778	1	2·5348	·864046	·244440
7	13·8653	·428260	·028809	2	2·6063	·861296	·238830
8	13·6229	·437582	·029925	3	2·5294	·864255	·244874
9	13·3690	·447345	·031133	4	2·2068	·876662	·273378
50	13·1035	·457558	·032443	95	1·8185	·891597	·316340
1	12·8275	·468174	·033858	6	1·3896	·908091	·380011
2	12·5431	·479110	·035377	7	·9429	·925272	·476226
3	12·2519	·490313	·037000	8	·4808	·943048	·636863
4	11·9545	·501752	·038732	9	·0000	·961539	·961539

HF.

FOUR AND A HALF PER-CENT.

H^F.

4½ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	64 392·8	1 148 675	19 196 516	12 155·4	334 185·9	10
1	61 426·4	1 087 248	18 047 842	11 961·9	322 030·4	1
2	58 533·6	1 028 715	16 960 594	11 714·3	310 068·5	2
3	55 725·2	972 989·5	15 931 879	11 426·5	298 354·2	3
4	53 011·8	919 977·7	14 958 889	11 112·8	286 927·8	4
15	50 402·5	869 575·2	14 038 912	10 786·2	275 815·0	15
6	47 902·2	821 673·0	13 169 336	10 456·4	265 028·8	6
7	45 516·3	776 156·7	12 347 663	10 133·2	254 572·4	7
8	43 248·3	732 908·4	11 571 507	9 825·30	244 439·2	8
9	41 100·4	691 808·0	10 838 598	9 539·76	234 613·9	9
20	39 067·2	652 740·8	10 146 790	9 276·46	225 074·1	20
1	37 127·8	615 613·0	9 494 050	9 019·34	215 797·7	1
2	35 270·0	580 342·9	8 878 437	8 760·39	206 778·3	2
3	33 483·8	546 859·1	8 298 094	8 492·96	198 017·9	3
4	31 759·2	515 099·9	7 751 234	8 210·28	189 525·0	4
25	30 092·5	485 007·4	7 236 135	7 911·15	181 314·7	25
6	28 485·2	456 522·2	6 751 127	7 599·76	173 403·5	6
7	26 948·4	429 573·8	6 294 605	7 289·58	165 803·8	7
8	25 483·3	404 090·5	5 865 031	6 984·89	158 514·2	8
9	24 092·9	379 997·5	5 460 941	6 691·92	151 529·3	9
30	22 779·9	357 217·6	5 080 943	6 416·38	144 837·4	30
1	21 540·6	335 677·0	4 723 726	6 158·07	138 421·0	1
2	20 371·7	315 305·2	4 388 049	5 916·74	132 263·0	2
3	19 268·9	296 036·3	4 072 743	5 691·20	126 346·2	3
4	18 224·2	277 812·1	3 776 707	5 476·26	120 655·0	4
35	17 235·1	260 577·0	3 498 895	5 271·86	115 178·8	35
6	16 298·9	244 278·1	3 238 318	5 077·90	109 906·9	6
7	15 411·5	228 866·7	2 994 040	4 892·30	104 829·0	7
8	14 570·2	214 296·5	2 765 173	4 714·68	99 936·71	8
9	13 772·8	200 523·7	2 550 877	4 544·72	95 222·03	9
40	13 017·1	187 506·6	2 350 353	4 382·08	90 677·31	40
1	12 300·2	175 206·4	2 162 846	4 225·78	86 295·24	1
2	11 620·5	163 585·9	1 987 640	4 075·74	82 069·46	2
3	10 976·2	152 609·7	1 824 054	3 931·86	77 993·72	3
4	10 365·4	142 244·2	1 671 445	3 793·74	74 061·87	4
45	9 786·37	132 457·8	1 529 200	3 661·02	70 268·13	45
6	9 237·41	123 220·4	1 396 743	3 533·48	66 607·12	6
7	8 717·96	114 502·5	1 273 522	3 411·82	63 073·63	7
8	8 226·73	106 275·8	1 159 020	3 296·00	59 661·82	8
9	7 762·21	98 513·54	1 052 744	3 185·74	56 365·82	9
50	7 322·78	91 190·76	954 230·3	3 080·57	53 180·07	50
1	6 906·16	84 284·60	863 039·5	2 979·29	50 099·51	1
2	6 509·92	77 774·67	778 754·9	2 880·44	47 120·22	2
3	6 132·29	71 642·39	700 980·3	2 783·14	44 239·77	3
4	5 771·94	65 870·44	629 337·9	2 686·87	41 456·64	4

HF.

4½ PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	5 427·36	60 443·09	563 467·4	2 590·83	38 769·77	55
6	5 098·77	55 344·32	503 024·4	2 495·96	36 178·94	6
7	4 786·14	50 558·18	447 680·0	2 402·89	33 682·98	7
8	4 488·95	46 069·23	397 121·9	2 311·80	31 280·10	8
9	4 206·55	41 862·68	351 052·6	2 222·71	28 968·29	9
60	3 937·65	37 925·03	309 189·9	2 134·95	26 745·59	60
1	3 678·85	34 246·18	271 264·9	2 045·72	24 610·64	1
2	3 429·37	30 816·81	237 018·7	1 954·65	22 564·92	2
3	3 188·30	27 628·52	206 201·9	1 861·26	20 610·27	3
4	2 955·29	24 673·22	178 573·4	1 765·55	18 749·01	4
65	2 730·44	21 942·78	153 900·2	1 667·96	16 983·46	65
6	2 515·20	19 427·58	131 957·4	1 570·30	15 315·50	6
7	2 310·19	17 117·40	112 529·8	1 473·59	13 745·21	7
8	2 114·76	15 002·64	95 412·42	1 377·64	12 271·62	8
9	1 928·61	13 074·02	80 409·78	1 282·57	10 893·97	9
70	1 751·46	11 322·57	67 335·76	1 188·46	9 611·403	70
1	1 582·78	9 739·789	56 013·19	1 095·20	8 422·941	1
2	1 420·79	8 318·996	46 273·40	1 001·38	7 327·739	2
3	1 265·56	7 053·434	37 954·41	907·327	6 326·362	3
4	1 117·72	5 935·719	30 900·97	813·979	5 419·035	4
75	977·861	4 957·858	24 965·25	722·256	4 605·056	75
6	846·992	4 110·866	20 007·39	633·496	3 882·800	6
7	726·188	3 384·677	15 896·53	549·166	3 249·303	7
8	618·640	2 766·037	12 511·85	472·889	2 700·138	8
9	523·889	2 242·148	9 745·815	404·777	2 227·249	9
80	441·500	1 800·648	7 503·667	344·949	1 822·472	80
1	371·035	1 429·613	5 703·019	293·495	1 477·524	1
2	311·180	1 118·433	4 273·406	249·617	1 184·028	2
3	258·563	859·871	3 154·973	210·400	934·411	3
4	211·486	648·384	2 295·102	174·458	724·011	4
85	169·432	478·952	1 646·718	141·511	549·552	85
6	132·038	346·915	1 167·766	111·413	408·041	6
7	99·5480	247·367	820·851	84·6091	296·628	7
8	72·6879	174·679	573·485	62·0358	212·019	8
9	51·5965	123·082	398·806	44·0744	149·983	9
90	35·9175	87·165	275·724	30·6173	105·909	90
1	24·9175	62·247	188·559	21·1640	75·291	1
2	17·4302	44·817	126·312	14·7497	54·127	2
3	12·8099	32·007	81·495	10·8800	39·378	3
4	10·0556	21·952	49·488	8·6773	28·498	4
95	7·8356	14·116	27·536	6·8903	19·820	95
6	5·9342	8·182	13·420	5·3263	12·930	6
7	4·2240	3·958	5·239	3·8717	7·604	7
8	2·6769	1·281	1·281	2·5065	3·732	8
9	1·2808	·000	·000	1·2257	1·226	9

H F.

$4\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·808 837	$\bar{1}$·979 518	5·191 163	0·020 482	6·060 197	976 132	10
1	·788 355	·979 050	·211 645	·020 950	·036 329	975 966	1
2	·767 405	·978 647	·232 595	·021 353	·012 295	975 813	2
3	·746 052	·978 321	·253 948	·021 679	5·988 108	975 669	3
4	·724 373	·978 079	·275 627	·021 921	·963 777	975 530	4
15	·702 452	·977 904	·297 548	·022 096	·939 307	975 392	15
6	·680 356	·977 811	·319 644	·022 189	·914 699	975 251	6
7	·658 167	·977 802	·341 833	·022 198	·889 950	975 100	7
8	·635 969	·977 877	·364 031	·022 123	·865 050	974 936	8
9	·613 846	·977 967	·386 154	·022 033	·839 986	974 755	9
20	·591 813	·977 886	·408 187	·022 114	·814 741	974 567	20
1	·569 699	·977 707	·430 301	·022 293	·789 308	974 377	1
2	·547 406	·977 429	·452 594	·022 571	·763 685	974 190	2
3	·524 835	·977 035	·475 165	·022 965	·737 875	974 017	3
4	·501 870	·976 588	·498 130	·023 412	·711 892	973 856	4
25	·478 458	·976 162	·521 542	·023 838	·685 748	973 714	25
6	·454 620	·975 914	·545 380	·024 086	·659 462	973 576	6
7	·430 534	·975 721	·569 466	·024 279	·633 038	973 441	7
8	·406 255	·975 635	·593 745	·024 365	·606 479	973 302	8
9	·381 890	·975 662	·618 110	·024 338	·579 781	973 152	9
30	·357 552	·975 707	·642 448	·024 293	·552 933	972 989	30
1	·333 259	·975 769	·666 741	·024 231	·525 922	972 809	1
2	·309 028	·975 830	·690 972	·024 170	·498 731	972 614	2
3	·284 858	·975 791	·715 142	·024 209	·471 345	972 406	3
4	·260 649	·975 764	·739 351	·024 236	·443 751	972 185	4
35	·236 413	·975 746	·763 587	·024 254	·415 936	971 949	35
6	·212 159	·975 685	·787 841	·024 315	·387 885	971 698	6
7	·187 844	·975 621	·812 156	·024 379	·359 583	971 432	7
8	·163 465	·975 557	·836 535	·024 443	·331 015	971 151	8
9	·139 022	·975 491	·860 978	·024 509	·302 166	970 851	9
40	·114 513	·975 400	·885 487	·024 600	·273 017	970 533	40
1	·089 913	·975 312	·910 087	·024 688	·243 550	970 196	1
2	·065 225	·975 228	·934 775	·024 772	·213 746	969 836	2
3	·040 453	·975 135	·959 547	·024 865	·183 582	969 453	3
4	·015 588	·975 033	·984 412	·024 967	·153 035	969 043	4
45	3·990 621	·974 929	$\bar{4}$·009 379	·025 071	·122 078	968 605	45
6	·965 550	·974 865	·034 450	·025 135	·090 683	968 132	6
7	·940 415	·974 812	·059 585	·025 188	·058 815	967 619	7
8	·915 227	·974 759	·084 773	·025 241	·026 434	967 062	8
9	·889 986	·974 690	·110 014	·025 310	4·993 496	966 455	9
50	·864 676	·974 561	·135 324	·025 439	·959 951	965 797	50
1	·839 237	·974 339	·160 763	·025 661	·925 748	965 090	1
2	·813 576	·974 046	·186 424	·025 954	·890 838	964 332	2
3	·787 622	·973 700	·212 378	·026 300	·855 170	963 521	3
4	·761 322	·973 266	·238 678	·026 734	·818 691	962 656	4

Hf.

$4\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·939 803	023 868	4·084 770	993 031	$\bar{5}$·915 230	006 969	10
1	·963 671	024 034	·077 801	990 914	·922 199	009 086	1
2	·987 705	024 187	·068 715	989 198	·931 285	010 802	2
3	$\bar{6}$·011 892	024 331	·057 913	987 909	·942 087	012 091	3
4	·036 223	024 470	·045 822	987 046	·954 178	012 954	4
15	·060 693	024 608	·032 868	986 514	·967 132	013 486	15
6	·085 301	024 749	·019 382	986 365	·980 618	013 635	6
7	·110 050	024 900	·005 747	986 599	·994 253	013 401	7
8	·134 950	025 064	3·992 346	987 191	$\bar{4}$·007 654	012 809	8
9	·160 014	025 245	·979 537	987 845	·020 463	012 155	9
20	·185 259	025 433	·967 382	987 793	·032 618	012 207	20
1	·210 692	025 623	·955 175	987 348	·044 825	012 652	1
2	·236 315	025 810	·942 523	986 536	·057 477	013 464	2
3	·262 125	025 983	·929 059	985 299	·070 941	014 701	3
4	·288 108	026 144	·914 358	983 882	·085 642	016 118	4
25	·314 252	026 286	·898 240	982 560	·101 760	017 440	25
6	·340 538	026 424	·880 800	981 902	·119 200	018 098	6
7	·366 962	026 559	·862 702	981 458	·137 298	018 542	7
8	·393 521	026 698	·844 160	981 391	·155 840	018 609	8
9	·420 219	026 848	·825 551	981 739	·174 449	018 261	9
30	·447 067	027 011	·807 290	982 154	·192 710	017 846	30
1	·474 078	027 191	·789 444	982 639	·210 556	017 361	1
2	·501 269	027 386	·772 083	983 120	·227 917	016 880	2
3	·528 655	027 594	·755 203	983 281	·244 797	016 719	3
4	·556 249	027 815	·738 484	983 480	·261 516	016 520	4
35	·584 064	028 051	·721 964	983 720	·278 036	016 280	35
6	·612 115	028 302	·705 684	983 829	·294 316	016 171	6
7	·640 417	028 568	·689 513	983 940	·310 487	016 060	7
8	·668 985	028 849	·673 453	984 054	·326 547	015 946	8
9	·697 834	029 149	·657 507	984 173	·342 493	015 827	9
40	·726 983	029 467	·641 680	984 227	·358 320	015 773	40
1	·756 450	029 804	·625 907	984 299	·374 093	015 701	1
2	·786 254	030 164	·610 206	984 392	·389 794	015 608	2
3	·816 418	030 547	·594 598	984 469	·405 402	015 531	3
4	·846 965	030 957	·579 067	984 535	·420 933	015 465	4
45	·877 922	031 395	·563 602	984 601	·436 398	015 399	45
6	·909 317	031 868	·548 203	984 783	·451 797	015 217	6
7	·941 185	032 381	·532 986	985 001	·467 014	014 999	7
8	·973 566	032 938	·517 987	985 224	·482 013	014 776	8
9	$\bar{5}$·006 504	033 545	·503 211	985 420	·496 789	014 580	9
50	·040 049	034 203	·488 631	985 482	·511 369	014 518	50
1	·074 252	034 910	·474 113	985 346	·525 887	014 654	1
2	·109 162	035 668	·459 459	985 076	·540 541	014 924	2
3	·144 830	036 479	·444 535	984 711	·555 465	015 289	3
4	·181 309	037 344	·429 246	984 193	·570 754	015 807	4

H^F.

4½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·734 588	1̄·972 877	4·265 412	0·027 123	4·781 347	961 726	55
6	·707 465	·972 520	·292 535	·027 480	·743 073	960 719	6
7	·679 985	·972 160	·320 015	·027 840	·703 792	959 619	7
8	·652 145	·971 781	·347 855	·028 219	·663 411	958 416	8
9	·623 926	·971 311	·376 074	·028 689	·621 827	957 099	9
60	·595 237	·970 476	·404 763	·029 524	·578 926	955 686	60
1	·565 713	·969 501	·434 287	·030 499	·534 612	954 176	1
2	·535 214	·968 345	·464 786	·031 655	·488 788	952 570	2
3	·503 559	·967 042	·496 441	·032 958	·441 358	950 868	3
4	·470 601	·965 632	·529 399	·034 368	·392 226	949 066	4
65	·436 233	·964 340	·563 767	·035 660	·341 292	947 127	65
6	·400 573	·963 074	·599 427	·036 926	·288 419	945 019	6
7	·363 647	·961 614	·636 353	·038 386	·233 438	942 730	7
8	·325 261	·959 984	·674 739	·040 016	·176 168	940 241	8
9	·285 245	·958 155	·714 755	·041 845	·116 409	937 536	9
70	·243 400	·956 020	·756 600	·043 980	·053 945	934 605	70
1	·199 420	·953 111	·800 580	·046 889	3·988 550	931 521	1
2	·152 531	·949 752	·847 469	·050 248	·920 071	928 330	2
3	·102 283	·946 048	·897 717	·053 952	·848 401	925 072	3
4	·048 331	·941 946	·951 669	·058 054	·773 473	921 821	4
75	2·990 277	·937 603	3·009 723	·062 397	·695 294	918 639	75
6	·927 880	·933 169	·072 120	·066 831	·613 933	915 584	6
7	·861 049	·930 389	·138 951	·069 611	·529 517	912 341	7
8	·791 438	·927 801	·208 562	·072 199	·441 858	908 806	8
9	·719 239	·925 692	·280 761	·074 308	·350 664	904 765	9
80	·644 931	·924 484	·355 069	·075 516	·255 429	899 789	80
1	·569 415	·923 596	·430 585	·076 404	·155 218	893 392	1
2	·493 011	·919 555	·506 989	·080 445	·048 610	885 823	2
3	·412 566	·912 716	·587 434	·087 284	2·934 433	877 400	3
4	·325 282	·903 714	·674 718	·096 286	·811 833	868 459	4
85	·228 996	·891 702	·771 004	·108 298	·680 292	859 930	85
6	·120 698	·877 335	·879 302	·122 665	·540 222	853 119	6
7	1·998 033	·863 429	2·001 967	·136 571	·393 341	848 899	7
8	·861 462	·851 158	·138 538	·148 842	·242 240	847 955	8
9	·712 620	·842 686	·287 380	·157 314	·090 195	850 146	9
90	·555 306	·841 198	·444 694	·158 802	1·940 341	853 779	90
1	·396 504	·844 797	·603 496	·155 203	·794 120	857 323	1
2	·241 301	·866 245	·758 699	·133 755	·651 443	853 804	2
3	·107 546	·894 863	·892 454	·105 137	·505 247	836 217	3
4	·002 409	·891 661	·997 591	·108 339	·341 464	808 246	4
95	0·894 070	·879 292	1·105 930	·120 708	·149 710	763 136	95
6	·773 362	·852 365	·226 638	·147 635	0·912 846	684 600	6
7	·625 727	·801 907	·374 273	·198 093	·597 446	510 041	7
8	·427 634	·679 853	·572 366	·320 147	·107 487		8
9	·107 487		·892 513				9

4½ PER CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·218 653	038 274	3·413 439	983 798	$\bar{4}$·586 561	016 202	55
6	·256 927	039 281	·397 237	983 497	·602 763	016 503	6
7	·296 208	040 381	·380 734	983 217	·619 266	016 783	7
8	·336 589	041 584	·363 951	982 931	·636 049	017 069	8
9	·378 173	042 901	·346 882	982 506	·653 118	017 494	9
60	·421 074	044 314	·329 388	981 458	·670 612	018 542	60
1	·465 388	045 824	·310 846	980 223	·689 154	019 777	1
2	·511 212	047 430	·291 069	978 738	·708 931	021 262	2
3	·558 642	049 132	·269 807	977 073	·730 193	022 927	3
4	·607 774	050 934	·246 880	975 305	·753 120	024 695	4
65	·658 708	052 873	·222 185	973 796	·777 815	026 204	65
6	·711 581	054 981	·195 981	972 396	·804 019	027 604	6
7	·766 562	057 270	·168 377	970 760	·831 623	029 240	7
8	·823 832	059 759	·139 137	968 943	·860 863	031 057	8
9	·883 591	062 464	·108 080	866 905	·891 920	033 095	9
70	·946 055	065 395	·074 985	964 509	·925 015	035 491	70
1	$\bar{4}$·011 450	068 479	·039 494	961 103	·960 506	038 897	1
2	·079 929	071 670	·000 597	957 167	·999 403	042 833	2
3	·151 599	074 928	2·957 764	952 849	$\bar{3}$·042 236	047 151	3
4	·226 527	078 179	·910 613	948 078	·089 387	051 922	4
75	·304 706	081 361	·858 691	943 053	·141 309	056 947	75
6	·386 067	084 416	·801 744	937 959	·198 256	062 041	6
7	·470 483	087 659	·739 703	935 056	·260 297	064 944	7
8	·558 142	091 194	·674 759	932 457	·325 241	067 543	8
9	·649 336	095 235	·607 216	930 538	·392 784	069 462	9
80	·744 571	100 211	·537 754	929 847	·462 246	070 153	80
1	·844 782	106 608	·467 601	929 674	·532 399	070 326	1
2	·951 390	114 177	·397 275	925 771	·602 725	074 229	2
3	$\bar{3}$·065 567	122 600	·323 046	918 646	·676 954	081 354	3
4	·188 167	131 541	·241 692	909 099	·758 308	090 901	4
85	·319 708	140 070	·150 791	896 145	·849 209	103 855	85
6	·459 778	146 881	·046 936	880 481	·953 064	119 519	6
7	·606 659	151 101	1·927 417	865 225	$\bar{2}$·072 583	134 775	7
8	·757 760	152 045	·792 642	851 545	·207 358	148 455	8
9	·909 805	149 854	·644 187	841 780	·355 813	158 220	9
90	$\bar{2}$·059 659	146 221	·485 967	839 630	·514 033	160 370	90
1	·205 880	142 677	·325 597	843 185	·674 403	156 815	1
2	·348 557	146 196	·168 782	867 847	·831 218	132 153	2
3	·494 753	163 783	·036 629	901 757	·963 371	098 243	3
4	·658 536	191 754	0·938 386	899 851	1·061 614	100 149	4
95	·850 290	236 864	·838 237	888 192	·161 763	111 808	95
6	·087 154	315 400	·726 429	861 473	·273 571	138 527	6
7	·402 554	489 959	·587 902	811 162	·412 098	188 838	7
8	·892 513		·399 064	689 307	·600 936	310 693	8
9			·088 371		·911 629		9

H^F.

4½ PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	17·838 6	·188 770	·010 020	55	11·136 7	·477 365	·039 332
1	17·700 0	·194 736	·010 414	6	10·854 5	·489 522	·041 294
2	17·574 8	·200 129	·010 774	7	10·563 5	·502 052	·043 417
3	17·460 5	·205 051	·011 108	8	10·262 8	·514 999	·045 726
4	17·354 2	·209 628	·011 421	9	9·951 8	·528 392	·048 247
15	17·252 6	·214 002	·011 724	60	9·631 4	·542 189	·050 999
6	17·153 1	·218 286	·012 025	1	9·308 9	·556 075	·053 941
7	17·052 3	·222 628	·012 332	2	8·986 2	·569 974	·057 076
8	16·946 5	·227 184	·012 659	3	8·665 6	·583 778	·060 398
9	16·832 1	·232 109	·013 016	4	8·348 8	·597 419	·063 903
20	16·708 1	·237 449	·013 409	65	8·036 4	·610 875	·067 602
1	16·580 9	·242 927	·013 818	6	7·724 1	·624 323	·071 563
2	16·454 3	·248 380	·014 230	7	7·409 5	·637 867	·075 851
3	16·332 0	·253 643	·014 634	8	7·094 3	·651 444	·080 482
4	16·218 9	·258 517	·015 014	9	6·779 0	·665 020	·085 489
25	16·117 2	·262 895	·015 358	70	6·464 7	·678 555	·090 903
6	16·026 6	·266 796	·015 669	1	6·153 6	·691 950	·096 727
7	15·940 6	·270 501	·015 968	2	5·855 2	·704 801	·102 813
8	15·857 1	·274 097	·016 260	3	5·573 4	·716 937	·109 067
9	15·772 1	·277 755	·016 561	4	5·310 6	·728 252	·115 402
30	15·681 3	·281 668	·016 885	75	5·070 1	·738 608	·121 679
1	15·583 4	·285 881	·017 239	6	4·853 5	·747 937	·127 776
2	15·477 6	·290 439	·017 626	7	4·660 9	·756 230	·133 589
3	15·363 4	·295 356	·018 050	8	4·471 2	·764 400	·139 715
4	15·244 1	·300 493	·018 499	9	4·279 8	·772 639	·146 339
35	15·119 0	·305 880	·018 976	80	4·078 5	·781 310	·153 847
6	14·987 4	·311 548	·019 487	1	3·853 0	·791 017	·162 994
7	14·850 4	·317 446	·020 028	2	3·594 2	·802 165	·174 605
8	14·707 9	·323 585	·020 600	3	3·325 6	·813 731	·188 121
9	14·559 4	·329 978	·021 208	4	3·065 8	·824 916	·202 889
40	14·404 7	·336 641	·021 853	85	2·826 8	·835 209	·218 252
1	14·244 2	·343 553	·022 537	6	2·627 4	·843 797	·232 618
2	14·077 3	·350 736	·023 263	7	2·484 9	·849 933	·243 891
3	13·903 7	·358 216	·024 035	8	2·403 1	·853 454	·250 785
4	13·722 9	·365 999	·024 859	9	2·385 5	·854 214	·252 317
45	13·534 9	·374 094	·025 738	90	2·426 8	·852 434	·248 755
6	13·339 3	·382 519	·026 676	1	2·498 1	·849 363	·242 804
7	13·134 1	·391 355	·027 689	2	2·571 2	·846 215	·236 953
8	12·918 3	·400 645	·028 785	3	2·498 6	·849 342	·242 765
9	12·691 4	·410 417	·029 976	4	2·183 0	·862 933	·271 106
50	12·453 0	·420 683	·031 271	95	1·801 5	·879 360	·313 886
1	12·204 3	·431 396	·032 671	6	1·378 7	·897 567	·377 328
2	11·947 1	·442 469	·034 175	7	·937 0	·916 591	·473 213
3	11·682 8	·453 850	·035 785	8	·478 5	·936 334	·633 314
4	11·412 2	·465 504	·037 504	9	·000 0	·956 938	·956 938

H^F.

FIVE PER-CENT.

HF.

5 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	61 391·3	1 013 415·	16 006 094·	10 210·1	261 430·3	10
1	58 284·3	955 130·8	14 992 679·	10 026·5	251 220·2	1
2	55 275·0	899 855·8	14 037 549·	9 792·60	241 193·7	2
3	52 372·4	847 483·4	13 137 693·	9 522·14	231 401·1	3
4	49 585·0	797 898·3	12 290 209·	9 228·69	221 879·0	4
15	46 919·9	750 978·5	11 492 311·	8 924·69	212 650·3	15
6	44 380·0	706 598·5	10 741 333·	8 619·13	203 725·6	6
7	41 968·7	664 629·8	10 034 734·	8 321·14	195 106·5	7
8	39 687·6	624 942·1	9 370 104·	8 038·59	186 785·3	8
9	37 536·9	587 405·2	8 745 162·	7 777·80	178 746·7	9
20	35 510·2	551 895·1	8 157 757·	7 538·47	170 968·9	20
1	33 586·6	518 308·5	7 605 862·	7 305·88	163 430·5	1
2	31 754·1	486 554·4	7 087 554·	7 072·74	156 124·6	2
3	30 002·4	456 552·0	6 600 999·	6 833·12	149 051·8	3
4	28 321·6	428 230·4	6 144 447·	6 581·03	142 218·7	4
25	26 707·5	401 522·9	5 716 217·	6 315·55	135 637·7	25
6	25 160·6	376 362·3	5 314 694·	6 040·50	129 322·1	6
7	23 689·8	352 672·4	4 938 332·	5 767·83	123 281·6	7
8	22 295·2	330 377·2	4 585 659·	5 501·26	117 513·8	8
9	20 978·4	309 398·8	4 255 282·	5 246·17	112 012·5	9
30	19 740·7	289 658·2	3 945 883·	5 007·38	106 766·4	30
1	18 577·8	271 080·3	3 656 225·	4 784·60	101 759·0	1
2	17 486·1	253 594·3	3 385 145·	4 577·46	96 974·39	2
3	16 460·7	237 133·6	3 131 550·	4 384·78	92 396·93	3
4	15 494·1	221 639·5	2 894 417·	4 202·04	88 012·15	4
35	14 583·4	207 056·1	2 672 777·	4 029·09	83 810·10	35
6	13 725·6	193 330·5	2 465 721·	3 865·76	79 781·01	6
7	12 916·4	180 414·1	2 272 391·	3 710·20	75 915·25	7
8	12 153·2	168 260·9	2 091 977·	3 562·05	72 205·05	8
9	11 433·4	156 827·5	1 923 716·	3 420·96	68 642·99	9
40	10 754·6	146 073·0	1 766 888·	3 286·59	65 222·03	40
1	10 113·9	135 959·1	1 620 815·	3 158·07	61 935·45	1
2	9 509·52	126 449·5	1 484 856·	3 035·28	58 777·38	2
3	8 939·51	117 510·0	1 358 407·	2 918·10	55 742·10	3
4	8 401·86	109 108·2	1 240 897·	2 806·15	52 824·00	4
45	7 894·71	101 213·5	1 131 788·	2 699·08	50 017·85	45
6	7 416·38	93 797·08	1 030 575·	2 596·69	47 318·77	6
7	6 966·00	86 831·08	936 778·0	2 499·47	44 722·08	7
8	6 542·18	80 288·90	849 946·9	2 407·37	42 222·61	8
9	6 143·39	74 145·51	769 658·0	2 320·11	39 815·24	9
50	5 768·00	68 377·50	695 512·5	2 237·27	37 495·13	50
1	5 413·94	62 963·56	627 135·0	2 157·87	35 257·86	1
2	5 079·01	57 884·55	564 171·4	2 080·75	33 100·00	2
3	4 761·60	53 122·95	506 286·9	2 005·19	31 019·25	3
4	4 460·46	48 662·49	453 163·9	1 930·80	29 014·05	4

HF.

5 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	4 174·20	44 488·29	404 501·4	1 856·94	27 083·26	55
6	3 902·80	40 585·49	360 013·1	1 784·31	25 226·32	6
7	3 646·06	36 939·43	319 427·6	1 713·42	23 442·01	7
8	3 403·38	33 536·05	282 488·2	1 644·36	21 728·59	8
9	3 174·08	30 361·97	248 952·1	1 577·13	20 084·23	9
60	2 957·04	27 404·93	218 590·2	1 511·23	18 507·10	60
1	2 749·53	24 655·40	191 185·2	1 444·54	16 995·88	1
2	2 550·87	22 104·53	166 529·8	1 376·80	15 551·34	2
3	2 360·26	19 744·28	144 425·3	1 307·66	14 174·54	3
4	2 177·35	17 566·93	124 681·0	1 237·15	12 866·88	4
65	2 002·11	15 564·82	107 114·1	1 165·59	11 629·73	65
6	1 835·50	13 729·32	91 549·29	1 094·32	10 464·15	6
7	1 677·86	12 051·46	77 819·96	1 024·08	9 369·831	7
8	1 528·61	10 522·86	65 768·50	954·729	8 345·749	8
9	1 387·42	9 135·435	55 245·65	886·331	7 391·020	9
70	1 253·98	7 881·459	46 110·21	818·955	6 504·689	70
1	1 127·81	6 753·648	38 228·75	752·503	5 685·734	1
2	1 007·57	5 746·080	31 475·10	685·966	4 933·231	2
3	893·210	4 852·870	25 729·02	619·587	4 247·266	3
4	785·107	4 067·763	20 876·15	554·018	3 627·678	4
75	683·600	3 384·164	16 808·39	489·896	3 073·660	75
6	589·293	2 794·871	13 424·23	428·142	2 583·764	6
7	502·838	2 292·034	10 629·36	369·748	2 155·622	7
8	426·328	1 865·706	8 337·322	317·183	1 785·874	8
9	359·312	1 506·394	6 471·616	270·468	1 468·691	9
80	301·363	1 205·031	4 965·222	229·630	1 198·222	80
1	252·059	952·973	3 760·191	194·676	968·592	1
2	210·390	742·583	2 807·218	165·010	773·916	2
3	173·983	568·600	2 064·635	138·622	608·906	3
4	141·628	426·972	1 496·035	114·552	470·284	4
85	112·925	314·047	1 069·063	92·593 1	355·732	85
6	87·582 9	226·464	755·016	72·628 3	263·139	6
7	65·717 5	160·747	528·552	54·933 5	190·511	7
8	47·757 0	112·990	367·806	40·102 5	135·577	8
9	33·738 2	79·251	254·816	28·357 8	95·475	9
90	23·374 1	55·877	175·565	19·600 2	67·117	90
1	16·138 4	39·739	119·688	13·477 6	47·517	1
2	11·235 3	28·503	79·949	9·343 0	34·039	2
3	8·217 8	20·286	51·445	6·860 5	24·696	3
4	6·420 2	13·866	31·160	5·454 2	17·836	4
95	4·978 9	8·887	17·294	4·318 6	12·382	95
6	3·752 8	5·134	8·408	3·329 6	8·063	6
7	2·658 6	2·475	3·274	2·414 1	4·733	7
8	1·676 8	·798	·798	1·558 9	2·319	8
9	·798 5			·760 4	·760	9

Hf.

5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	4·788 107	$\bar{1}$·977 445	5·211 893	0·022 555	6·005 787	974 276	10
1	·765 552	·976 977	·234 448	·023 023	5·980 063	974 110	1
2	·742 529	·976 574	·257 471	·023 426	·954 173	973 958	2
3	·719 103	·976 248	·280 897	·023 752	·928 131	973 817	3
4	·695 351	·976 006	·304 649	·023 994	·901 948	973 680	4
15	·671 357	·975 830	·328 643	·024 170	·875 628	973 545	15
6	·647 187	·975 738	·352 813	·024 262	·849 173	973 407	6
7	·622 925	·975 730	·377 075	·024 270	·822 580	973 260	7
8	·598 655	·975 804	·401 345	·024 196	·795 840	973 098	8
9	·574 459	·975 894	·425 541	·024 106	·768 938	972 919	9
20	·550 353	·975 813	·449 647	·024 187	·741 857	972 731	20
1	·526 166	·975 634	·473 834	·024 366	·714 588	972 544	1
2	·501 800	·975 356	·498 200	·024 644	·687 132	972 358	2
3	·477 156	·974 962	·522 844	·025 038	·659 490	972 188	3
4	·452 118	·974 515	·547 882	·025 485	·631 678	972 032	4
25	·426 633	·974 089	·573 367	·025 911	·603 710	971 896	25
6	·400 722	·973 840	·599 278	·026 160	·575 606	971 766	6
7	·374 562	·973 649	·625 438	·026 351	·547 372	971 638	7
8	·348 211	·973 562	·651 789	·026 438	·519 010	971 509	8
9	·321 773	·973 589	·678 227	·026 411	·490 519	971 367	9
30	·295 362	·973 633	·704 638	·026 367	·461 886	971 212	30
1	·268 995	·973 697	·731 005	·026 303	·433 098	971 041	1
2	·242 692	·973 756	·757 308	·026 244	·404 139	970 854	2
3	·216 448	·973 719	·783 552	·026 281	·374 993	970 654	3
4	·190 167	·973 690	·809 833	·026 310	·345 647	970 441	4
35	·163 857	·973 674	·836 143	·026 326	·316 088	970 212	35
6	·137 531	·973 611	·862 469	·026 389	·286 300	969 970	6
7	·111 142	·973 549	·888 858	·026 451	·256 270	969 713	7
8	·084 691	·973 484	·915 309	·026 516	·225 983	969 439	8
9	·058 175	·973 418	·941 825	·026 582	·195 422	969 148	9
40	·031 593	·973 327	·968 407	·026 673	·164 570	968 838	40
1	·004 920	·973 239	·995 080	·026 761	·133 408	968 509	1
2	3·978 159	·973 155	$\bar{4}$·021 841	·026 845	·101 917	968 158	2
3	·951 314	·973 062	·048 686	·026 938	·070 075	967 782	3
4	·924 376	·972 960	·075 624	·027 040	·037 857	967 381	4
45	·897 336	·972 856	·102 664	·027 144	·005 238	966 951	45
6	·870 192	·972 792	·129 808	·027 208	4·972 189	966 486	6
7	·842 984	·972 739	·157 016	·027 261	·938 675	965 981	7
8	·815 723	·972 685	·184 277	·027 315	·904 656	965 429	8
9	·788 408	·972 618	·211 592	·027 382	·870 085	964 828	9
50	·761 026	·972 487	·238 974	·027 513	·834 913	964 176	50
1	·733 513	·972 266	·266 487	·027 734	·799 089	963 474	1
2	·705 779	·971 974	·294 221	·028 026	·762 563	962 719	2
3	·677 753	·971 627	·322 247	·028 373	·725 282	961 912	3
4	·649 380	·971 193	·350 620	·028 807	·687 194	961 052	4

H^F.

5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{7}$·994 213	025 724	4·009 028	992 120	$\bar{5}$·990 972	007 880	10
1	$\bar{6}$·019 937	025 890	·001 148	989 750	·998 852	010 250	1
2	·045 827	026 042	3·990 898	987 837	$\bar{4}$·009 102	012 163	2
3	·071 869	026 183	·978 735	986 405	·021 265	013 595	3
4	·098 052	026 320	·965 140	985 453	·034 860	014 547	4
15	·124 372	026 455	·950 593	984 871	·049 407	015 129	15
6	·150 827	026 593	·935 464	984 719	·064 536	015 281	6
7	·177 420	026 740	·920 183	984 997	·079 817	015 003	7
8	·204 160	026 902	·905 180	985 677	·094 820	014 323	8
9	·231 062	027 081	·890 857	986 426	·109 143	013 574	9
20	·258 143	027 269	·877 283	986 389	·122 717	013 611	20
1	·285 412	027 456	·863 672	985 916	·136 328	014 084	1
2	·312 868	027 642	·849 588	985 031	·150 412	014 969	2
3	·340 510	027 812	·834 619	983 675	·165 381	016 325	3
4	·368 322	027 968	·818 294	982 118	·181 706	017 882	4
25	·396 290	028 104	·800 412	980 661	·199 588	019 339	25
6	·424 394	028 234	·781 073	979 940	·218 927	020 060	6
7	·452 628	028 362	·761 013	979 449	·238 987	020 551	7
8	·480 990	028 491	·740 462	979 380	·259 538	020 620	8
9	·509 481	028 633	·719 842	979 769	·280 158	020 231	9
30	·538 114	028 788	·699 611	980 235	·300 389	019 765	30
1	·566 902	028 959	·679 846	980 779	·320 154	019 221	1
2	·595 861	029 146	·660 625	981 323	·339 375	018 677	2
3	·625 007	029 346	·641 948	981 513	·358 052	018 487	3
4	·654 353	029 559	·623 461	981 746	·376 539	018 254	4
35	·683 912	029 788	·605 207	982 028	·394 793	017 972	35
6	·713 700	030 030	·587 235	982 163	·412 765	017 837	6
7	·743 730	030 287	·569 398	982 303	·430 602	017 697	7
8	·774 017	030 561	·551 701	982 447	·448 299	017 553	8
9	·804 578	030 852	·534 148	982 597	·465 852	017 403	9
40	·835 430	031 162	·516 745	982 677	·483 255	017 323	40
1	·866 592	031 491	·499 422	982 777	·500 578	017 223	1
2	·898 083	031 842	·482 199	982 901	·517 801	017 099	2
3	·929 925	032 218	·465 100	983 011	·534 900	016 989	3
4	·962 143	032 619	·448 111	983 105	·551 889	016 895	4
45	·994 762	033 049	·431 216	983 204	·568 784	016 796	45
6	$\bar{5}$·027 811	033 514	·414 420	983 428	·585 580	016 572	6
7	·061 325	034 019	·397 848	983 695	·602 152	016 305	7
8	·095 344	034 571	·381 543	983 965	·618 457	016 035	8
9	·129 915	035 172	·365 508	984 209	·634 492	015 791	9
50	·165 087	035 824	·349 717	984 308	·650 283	015 692	50
1	·200 911	036 526	·334 025	984 195	·665 975	015 805	1
2	·237 437	037 281	·318 220	983 936	·681 780	016 064	2
3	·274 718	038 088	·302 156	983 581	·697 844	016 419	3
4	·312 806	038 948	·285 737	983 060	·714 263	016 940	4

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5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log p_x)	Colog D_x	Δ (Colog p_x)	Log N_x	Δ	x
55	3·620 573	1·970 804	4·379 427	0·029 196	4·648 246	960 125	55
6	·591 377	·970 447	·408 623	·029 553	·608 371	959 119	6
7	·561 824	·970 086	·438 176	·029 914	·567 490	958 022	7
8	·531 910	·969 708	·468 090	·030 292	·525 512	956 818	8
9	·501 618	·969 239	·498 382	·030 761	·482 330	955 499	9
60	·470 857	·968 402	·529 143	·031 598	·437 829	954 083	60
1	·439 259	·967 428	·560 741	·032 572	·391 912	952 569	1
2	·406 687	·966 272	·593 313	·033 728	·344 481	950 960	2
3	·372 959	·964 969	·627 041	·035 031	·295 441	949 255	3
4	·337 928	·963 559	·662 072	·036 441	·244 696	947 448	4
65	·301 487	·962 267	·698 513	·037 733	·192 144	945 505	65
6	·263 754	·961 002	·736 246	·038 998	·137 649	943 391	6
7	·224 756	·959 540	·775 244	·040 460	·081 040	941 094	7
8	·184 296	·957 912	·815 704	·042 088	·022 134	938 595	8
9	·142 208	·956 081	·857 792	·043 919	3·960 729	935 878	9
70	·098 289	·953 947	·901 711	·046 053	·896 607	932 931	70
1	·052 236	·951 038	·947 764	·048 962	·829 538	929 834	1
2	·003 274	·947 680	·996 726	·052 320	·759 372	926 627	2
3	2·950 954	·943 975	3·049 046	·056 025	·685 999	923 357	3
4	·894 929	·939 873	·105 071	·060 127	·609 356	920 095	4
75	·834 802	·935 529	·165 198	·064 471	·529 451	916 911	75
6	·770 331	·931 097	·229 669	·068 903	·446 362	913 859	6
7	·701 428	·928 316	·298 572	·071 684	·360 221	910 622	7
8	·629 744	·925 727	·370 256	·074 273	·270 843	907 096	8
9	·555 471	·923 619	·444 529	·076 381	·177 939	903 059	9
80	·479 090	·922 411	·520 910	·077 589	·080 998	898 082	80
1	·401 501	·921 523	·598 499	·078 477	2·979 080	891 665	1
2	·323 024	·917 482	·676 976	·082 518	·870 745	884 062	2
3	·240 506	·910 644	·759 494	·089 356	·754 807	875 593	3
4	·151 150	·901 640	·848 850	·098 360	·630 400	866 595	4
85	·052 790	·889 629	·947 210	·110 371	·496 995	858 004	85
6	1·942 419	·875 262	2·057 581	·124 738	·354 999	851 143	6
7	·817 681	·861 356	·182 319	·138 644	·206 142	846 896	7
8	·679 037	·849 085	·320 963	·150 915	·053 038	845 968	8
9	·528 122	·840 613	·471 878	·159 387	1·899 006	848 229	9
90	·368 735	·839 125	·631 265	·160 875	·747 235	851 980	90
1	·207 860	·842 725	·792 140	·157 275	·599 215	855 683	1
2	·050 585	·864 171	·949 415	·135 829	·454 898	852 291	2
3	0·914 756	·892 790	1·085 244	·107 210	·307 189	834 747	3
4	·807 546	·889 588	·192 454	·110 412	·141 936	806 799	4
95	·697 134	·877 219	·302 866	·122 781	0·948 735	761 705	95
6	·574 353	·850 292	·425 647	·149 708	·710 440	683 181	6
7	·424 645	·799 834	·575 355	·200 166	·393 621	508 638	7
8	·224 479	·677 780	·775 521	·322 220	1·902 259		8
9	1·902 259		0·097 741				9

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5 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·351 754	039 875	3·268 797	982 674	4·731 203	017 326	55
6	·391 629	040 881	·251 471	982 392	·748 529	017 608	6
7	·432 510	041 978	·233 863	982 134	·766 137	017 866	7
8	·474 488	043 182	·215 997	981 870	·784 003	018 130	8
9	·517 670	044 501	·197 867	981 463	·802 133	018 537	9
60	·562 171	045 917	·179 330	980 399	·820 670	019 601	60
1	·608 088	047 431	·159 729	979 141	·840 271	020 859	1
2	·655 519	049 040	·138 870	977 625	·861 130	022 375	2
3	·704 559	050 745	·116 495	975 926	·883 505	024 074	3
4	·755 304	052 552	·092 421	974 123	·907 579	025 877	4
65	·807 856	054 495	·066 544	972 599	·933 456	027 401	65
6	·862 351	056 609	·039 143	971 192	·960 857	028 808	6
7	·918 960	058 906	·010 335	969 545	·989 665	030 455	7
8	·977 866	061 405	2·979 880	967 716	$\bar{3}$·020 120	032 284	8
9	$\bar{4}$·039 271	064 122	·947 596	965 664	·052 404	034 336	9
70	·103 393	067 069	·913 260	963 248	·086 740	036 752	70
1	·170 462	070 166	·876 508	959 794	·123 492	040 206	1
2	·240 628	073 373	·836 302	955 801	·163 698	044 199	2
3	·314 001	076 643	·792 103	951 421	·207 897	048 579	3
4	·390 644	079 905	·743 524	946 580	·256 476	053 420	4
75	·470 549	083 089	·690 104	941 484	·309 896	058 516	75
6	·553 638	086 141	·631 588	936 318	·368 412	063 682	6
7	·639 779	089 378	·567 906	933 404	·432 094	066 596	7
8	·729 157	092 904	·501 310	930 807	·498 690	069 193	8
9	·822 061	096 941	·432 117	928 912	·567 883	071 088	9
80	·919 002	101 918	·361 029	928 284	·638 971	071 716	80
1	$\bar{3}$·020 920	108 335	·289 313	928 197	·710 687	071 803	1
2	·129 255	115 938	·217 510	924 321	·782 490	075 679	2
3	·245 193	124 407	·141 831	917 172	·858 169	082 828	3
4	·369 600	133 405	·059 003	907 575	·940 997	092 425	4
85	·503 005	141 996	1·966 578	894 528	$\bar{2}$·033 422	105 472	85
6	·645 001	148 857	·861 106	878 731	·138 894	121 269	6
7	·793 858	153 104	·739 837	863 334	·260 163	136 666	7
8	·946 962	154 032	·603 171	849 501	·396 829	150 499	8
9	$\bar{2}$·100 994	151 771	·452 672	839 589	·547 328	160 411	9
90	·252 765	148 020	·292 261	837 350	·707 739	162 650	90
1	·400 785	144 317	·129 611	840 874	·870 389	159 126	1
2	·545 102	147 709	0·970 485	865 871	$\bar{1}$·029 515	134 129	2
3	·692 811	165 253	·836 356	900 374	·163 644	099 626	3
4	·858 064	193 201	·736 730	898 618	·263 270	101 382	4
95	$\bar{1}$·051 265	238 295	·635 348	887 046	·364 652	112 954	95
6	·289 560	316 819	·522 394	860 358	·477 606	139 642	6
7	·606 379	491 362	·382 752	810 072	·617 248	189 928	7
8	0·097 741		·192 824	688 246	·807 176	311 754	8
9			$\bar{1}$·881 070		0·118 930		9

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5 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	16·507 5	·166 311	·009 499	55	10·657 9	·444 861	·038 159
1	16·387 4	·172 027	·009 894	6	10·399 0	·457 188	·040 108
2	16·279 6	·177 161	·010 253	7	10·131 4	·469 936	·042 217
3	16·181 9	·181 816	·010 582	8	9·853 7	·483 155	·044 515
4	16·091 5	·186 119	·010 890	9	9·565 6	·496 877	·047 028
15	16·005 6	·190 212	·011 185	60	9·267 7	·511 062	·049 774
6	15·921 5	·194 212	·011 477	1	8·967 1	·525 375	·052 711
7	15·836 3	·198 270	·011 776	2	8·665 5	·539 738	·055 842
8	15·746 5	·202 547	·012 095	3	8·365 3	·554 033	·059 158
9	15·648 7	·207 204	·012 446	4	8·068 0	·568 189	·062 658
20	15·541 9	·212 290	·012 834	65	7·774 2	·582 180	·066 351
1	15·432 0	·217 524	·013 238	6	7·479 9	·596 196	·070 307
2	15·322 6	·222 735	·013 646	7	7·182 6	·610 350	·074 591
3	15·217 2	·227 753	·014 044	8	6·884 0	·624 574	·079 221
4	15·120 3	·232 368	·014 415	9	6·584 5	·638 834	·084 229
25	15·034 1	·236 471	·014 748	70	6·285 2	·653 087	·089 646
6	14·958 4	·240 077	·015 044	1	5·988 3	·667 225	·095 478
7	14·887 1	·243 473	·015 325	2	5·702 9	·680 813	·101 570
8	14·818 3	·246 746	·015 599	3	5·433 1	·693 664	·107 828
9	14·748 4	·250 074	·015 879	4	5·181 2	·705 659	·114 163
30	14·673 2	·253 658	·016 184	75	4·950 5	·716 643	·120 434
1	14·591 6	·257 543	·016 518	6	4·742 8	·726 535	·126 513
2	14·502 7	·261 778	·016 886	7	4·558 2	·735 324	·132 295
3	14·406 1	·266 379	·017 291	8	4·376 2	·743 989	·138 385
4	14·304 7	·271 202	·017 720	9	4·192 4	·752 741	·144 969
35	14·198 1	·276 280	·018 179	80	3·998 6	·761 972	·152 437
6	14·085 4	·281 646	·018 670	1	3·780 8	·772 345	·161 553
7	13·967 8	·287 247	·019 191	2	3·529 6	·784 307	·173 153
8	13·845 0	·293 096	·019 744	3	3·268 1	·796 755	·186 675
9	13·716 6	·299 208	·020 331	4	3·014 7	·808 822	·201 463
40	13·582 4	·305 599	·020 957	85	2·781 0	·819 952	·216 860
1	13·442 8	·312 250	·021 620	6	2·585 7	·829 252	·231 266
2	13·297 1	·319 183	·022 325	7	2·446 0	·835 904	·242 571
3	13·145 0	·326 428	·023 077	8	2·365 9	·839 719	·249 476
4	12·986 2	·333 991	·023 880	9	2·349 0	·840 524	·250 977
45	12·820 4	·341 885	·024 738	90	2·390 6	·838 545	·247 318
6	12·647 3	·350 129	·025 656	1	2·462 4	·835 125	·241 200
7	12·465 0	·358 810	·026 648	2	2·537 0	·831 574	·235 110
8	12·272 5	·367 977	·027 725	3	2·468 5	·834 834	·240 690
9	12·069 2	·377 659	·028 897	4	2·159 7	·849 540	·268 869
50	11·854 6	·387 875	·030 174	95	1·784 9	·867 388	·311 460
1	11·629 9	·398 576	·031 558	6	1·368 0	·887 238	·374 678
2	11·396 8	·409 676	·033 047	7	·931 1	·908 045	·470 232
3	11·156 5	·421 118	·034 641	8	·476 2	·929 706	·629 800
4	10·909 8	·432 869	·036 346	9	·000 0	·952 381	·952 381

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SIX PER-CENT.

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6 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	55 839·5	799 851·0	11 345 587	7 404·17	165 052·1	10
1	52 513·3	747 337·7	10 545 736	7 238·76	157 648·0	1
2	49 332·2	698 005·5	9 798 399	7 030·03	150 409·2	2
3	46 300·7	651 704·8	9 100 393	6 790·92	143 379·2	3
4	43 422·9	608 281·9	8 448 688	6 533·94	136 588·3	4
15	40 701·3	567 580·7	7 840 407	6 270·23	130 054·3	15
6	38 134·9	529 445·8	7 272 826	6 007·67	123 784·1	6
7	35 722·7	493 723·1	6 743 380	5 754·03	117 776·4	7
8	33 462·4	460 260·7	6 249 657	5 515·80	112 022·4	8
9	31 350·5	428 910·3	5 789 396	5 297·99	106 506·6	9
20	29 377·9	399 532·3	5 360 486	5 099·99	101 208·6	20
1	27 524·4	372 007·9	4 960 954	4 909·38	96 108·60	1
2	25 777·2	346 230·7	4 588 946	4 720·12	91 199·22	2
3	24 125·4	322 105·3	4 242 715	4 527·44	86 479·10	3
4	22 559·0	299 546·3	3 920 610	4 326·64	81 951·66	4
25	21 072·6	278 473·7	3 621 063	4 117·18	77 625·02	25
6	19 664·9	258 808·8	3 342 590	3 902·20	73 507·84	6
7	18 340·7	240 468·2	3 083 781	3 691·10	69 605·64	7
8	17 098·1	223 370·1	2 843 313	3 486·67	65 914·54	8
9	15 936·5	207 433·6	2 619 943	3 292·88	62 427·87	9
30	14 854·7	192 578·9	2 412 509	3 113·20	59 134·98	30
1	13 847·8	178 731·1	2 219 930	2 947·14	56 021·78	1
2	12 911·1	165 820·0	2 041 199	2 794·20	53 074·64	2
3	12 039·3	153 780·7	1 875 379	2 653·28	50 280·44	3
4	11 225·5	142 555·2	1 721 598	2 520·88	47 627·16	4
35	10 465·9	132 089·3	1 579 043	2 396·76	45 106·28	35
6	9 757·40	122 331·9	1 446 954	2 280·65	42 709·52	6
7	9 095·55	113 236·4	1 324 622	2 171·11	40 428·88	7
8	8 477·37	104 759·0	1 211 385	2 067·77	38 257·77	8
9	7 900·03	96 858·96	1 106 626	1 970·28	36 190·00	9
40	7 360·89	89 498·08	1 009 768	1 878·30	34 219·73	40
1	6 857·10	82 640·98	920 269·4	1 791·17	32 341·42	1
2	6 386·50	76 254·48	837 628·5	1 708·71	30 550·25	2
3	5 947·05	70 307·43	761 374·0	1 630·75	28 841·54	3
4	5 536·64	64 770·79	691 066·6	1 556·98	27 210·79	4
45	5 153·36	59 617·43	626 295·8	1 487·09	25 653.81	45
6	4 795·45	54 821·97	566 678·3	1 420·88	24 166·72	6
7	4 461·75	50 360·23	511 856·4	1 358·62	22 745·84	7
8	4 150·76	46 209·47	461 496·1	1 300·18	21 387·22	8
9	3 860·97	42 348·50	415 286·7	1 245·34	20 087·04	9
50	3 590·85	38 757·65	372 938·2	1 193·76	18 841·70	50
1	3 338·63	35 419·02	334 180·5	1 144·80	17 647·94	1
2	3 102·55	32 316·47	298 761·5	1 097·69	16 503·14	2
3	2 881·21	29 435·26	266 445·0	1 051·98	15 405·44	3
4	2 673·53	26 761·73	237 009·8	1 007·38	14 353·47	4

Hf.

6 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	2 478·35	24 283·39	210 248·1	963·530	13 346·08	55
6	2 295·35	21 988·04	185 964·7	920·819	12 382·55	6
7	2 124·12	19 863·91	163 976·6	879·515	11 461·73	7
8	1 964·04	17 899·88	144 112·7	839·664	10 582·22	8
9	1 814·43	16 085·44	126 212·8	801·233	97 425·54	9
60	1 674·41	14 411·03	110 127·4	763·916	8 941·322	60
1	1 542·23	12 868·80	95 716·37	726·509	8 177·406	1
2	1 417·30	11 451·51	82 847·56	688·872	7 450·897	2
3	1 299·02	10 152·49	71 396·06	650·821	6 762·025	3
4	1 187·05	8 965·442	61 243·57	612·378	6 111·204	4
65	1 081·21	7 884·231	52 278·13	573·732	5 498·826	65
6	981·885	6 902·346	44 393·89	535·608	4 925·094	6
7	889·090	6 013·257	37 491·55	498·391	4 389·486	7
8	802·360	5 210·896	31 478·29	461·987	3 891·095	8
9	721·381	4 489·516	26 267·39	426·424	3 429·108	9
70	645·847	3 843·669	21 777·88	391·723	3 002·684	70
1	575·387	3 268·283	17 934·21	357·821	2 610·961	1
2	509·192	2 759·091	14 665·93	324·195	2 253·140	2
3	447·141	2 311·950	11 906·84	290·966	1 928·945	3
4	389·316	1 922·634	9 594·885	258·451	1 637·979	4
75	335·783	1 586·851	7 672·251	226·955	1 379·528	75
6	286·729	1 300·122	6 085·400	196·907	1 152·573	6
7	242·355	1 057·767	4 785·278	168·763	955·666	7
8	203·541	854·226	3 727·512	143·667	786·902	8
9	169·927	684·299	2 873·285	121·575	643·235	9
80	141·177	543·122	2 188·986	102·443	521·661	80
1	116·966	426·156	1 645·864	86·2232	419·217	1
2	96·7087	329·447	1 219·708	72·5867	332·994	2
3	79·2192	250·228	890·261	60·5713	260·407	3
4	63·8790	186·349	640·033	49·7152	199·836	4
85	50·4524	135·897	453·684	39·9044	150·121	85
6	38·7610	97·136	317·787	31·0687	110·217	6
7	28·8097	68·326	220·651	23·3115	79·148	7
8	20·7386	47·587	152·325	16·8711	55·836	8
9	14·5127	33·075	104·738	11·8191	38·965	9
90	9·9597	23·115	71·663	8·0875	27·146	90
1	6·8116	16·303	48·548	5·5033	19·059	1
2	4·6974	11·606	32·245	3·7746	13·555	2
3	3·4034	8·203	20·639	2·7465	9·781	3
4	2·6338	5·569	12·436	2·1695	7·034	4
95	2·0233	3·545	6·867	1·7081	4·865	95
6	1·5107	2·035	3·322	1·3100	3·157	6
7	1·0601	·975	1·287	·9449	1·847	7
8	·6623	·312	·312	·6071	·902	8
9	·3124	·000	·000	·2947	·295	9

H^F.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
10	4·746 941	1·973 329	5·253 059	0·026 671	5·903 009	970 508	10
1	·720 270	·972 860	·279 730	·027 140	·873 517	970 342	1
2	·693 130	·972 457	·306 870	·027 543	·843 859	970 192	2
3	·665 587	·972 132	·334 413	·027 868	·814 051	970 054	3
4	·637 719	·971 889	·362 281	·028 111	·784 105	969 923	4
15	·609 608	·971 714	·390 392	·028 286	·754 028	969 794	15
6	·581 322	·971 622	·418 678	·028 378	·723 822	969 661	6
7	·552 944	·971 613	·447 056	·028 387	·693 483	969 521	7
8	·524 557	·971 687	·475 443	·028 313	·663 004	969 363	8
9	·496 244	·971 777	·503 756	·028 223	·632 367	969 185	9
20	·468 021	·971 697	·531 979	·028 303	·601 552	969 000	20
1	·439 718	·971 517	·560 282	·028 483	·570 552	968 814	1
2	·411 235	·971 240	·588 765	·028 760	·539 366	968 632	2
3	·382 475	·970 845	·617 525	·029 155	·507 998	968 466	3
4	·353 320	·970 399	·646 680	·029 601	·476 464	968 320	4
25	·323 719	·969 972	·676 281	·030 028	·444 784	968 195	25
6	·293 691	·969 724	·706 309	·030 276	·412 979	968 079	6
7	·263 415	·969 532	·736 585	·030 468	·381 058	967 967	7
8	·232 947	·969 445	·767 053	·030 555	·349 025	967 854	8
9	·202 392	·969 473	·797 608	·030 527	·316 879	967 730	9
30	·171 865	·969 517	·828 135	·030 483	·284 609	967 591	30
1	·141 382	·969 580	·858 618	·030 420	·252 200	967 437	1
2	·110 962	·969 640	·889 038	·030 360	·219 637	967 265	2
3	·080 602	·969 602	·919 398	·030 398	·186 902	967 081	3
4	·050 204	·969 574	·949 796	·030 426	·153 983	966 885	4
35	·019 778	·969 556	·980 222	·030 444	·120 868	966 672	35
6	3·989 334	·969 495	$\bar{4}$·010 666	·030 505	·087 540	966 446	6
7	·958 829	·969 432	·041 171	·030 568	·053 986	966 205	7
8	·928 261	·969 368	·071 739	·030 632	·020 191	965 949	8
9	·897 629	·969 301	·102 371	·030 699	4·986 140	965 674	9
40	·866 930	·969 210	·133 070	·030 790	·951 814	965 382	40
1	·836 140	·969 123	·163 860	·030 877	·917 196	965 069	1
2	·805 263	·969 038	·194 737	·030 962	·882 265	964 736	2
3	·774 301	·968 946	·225 699	·031 054	·847 001	964 378	3
4	·743 247	·968 844	·256 753	·031 156	·811 379	963 994	4
45	·712 091	·968 739	·287 909	·031 261	·775 373	963 582	45
6	·680 830	·968 675	·319 170	·031 325	·738 955	963 133	6
7	·649 505	·968 623	·350 495	·031 377	·702 088	962 643	7
8	·618 128	·968 568	·381 872	·031 432	·664 731	962 107	8
9	·586 696	·968 501	·413 304	·031 499	·626 838	961 520	9
50	·555 197	·968 372	·444 803	·031 628	·588 358	960 879	50
1	·523 569	·968 149	·476 431	·031 851	·549 237	960 187	1
2	·491 718	·967 857	·508 282	·032 143	·509 424	959 444	2
3	·459 575	·967 510	·540 425	·032 490	·468 868	958 646	3
4	·427 085	·967 077	·572 915	·032 923	·427 514	957 795	4

H F.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{6}$·096 991	029 492	3·869 476	990 188	$\bar{4}$·130 524	009 812	10
1	·126 483	029 658	·859 664	987 293	·140 336	012 707	1
2	·156 141	029 808	·846 957	984 972	·153 043	015 028	2
3	·185 949	029 946	·831 929	983 246	·168 071	016 754	3
4	·215 895	030 077	·815 175	982 109	·184 825	017 891	4
15	·245 972	030 206	·797 284	981 422	·202 716	018 578	15
6	·276 178	030 339	·778 706	981 266	·221 294	018 734	6
7	·306 517	030 479	·759 972	981 636	·240 028	018 364	7
8	·336 996	030 637	·741 608	982 503	·258 392	017 497	8
9	·367 633	030 815	·724 111	983 459	·275 889	016 541	9
20	·398 448	031 000	·707 570	983 457	·292 430	016 543	20
1	·429 448	031 186	·691 027	982 926	·308 973	017 074	1
2	·460 634	031 368	·673 953	981 900	·326 047	018 100	2
3	·492 002	031 534	·655 853	980 298	·344 147	019 702	3
4	·523 536	031 680	·636 151	978 449	·363 849	021 551	4
25	·555 216	031 805	·614 600	976 710	·385 400	023 290	25
6	·587 021	031 921	·591 310	975 846	·408 690	024 154	6
7	·618 942	032 033	·567 156	975 255	·432 844	024 745	7
8	·650 975	032 146	·542 411	975 166	·457 589	024 834	8
9	·683 121	032 270	·517 577	975 630	·482 423	024 370	9
30	·715 391	032 409	·493 207	976 194	·506 793	023 806	30
1	·747 800	032 563	·469 401	976 856	·530 599	023 144	1
2	·780 363	032 735	·446 257	977 525	·553 743	022 475	2
3	·813 098	032 919	·423 782	977 770	·576 218	022 230	3
4	·846 017	033 115	·401 552	978 073	·598 448	021 927	4
35	·879 132	033 328	·379 625	978 433	·620 375	021 567	35
6	·912 460	033 554	·358 058	978 623	·641 942	021 377	6
7	·946 014	033 795	·336 681	978 821	·663 319	021 179	7
8	·979 809	034 051	·315 502	979 025	·684 498	020 975	8
9	5·013 860	034 326	·294 527	979 239	·705 473	020 761	9
40	·048 186	034 618	·273 766	979 371	·726 234	020 629	40
1	·082 804	034 931	·253 137	979 531	·746 863	020 469	1
2	·117 735	035 264	·232 668	979 720	·767 332	020 280	2
3	·152 999	035 622	·212 388	979 895	·787 612	020 105	3
4	·188 621	036 006	·192 283	980 054	·807 717	019 946	4
45	·224 627	036 418	·172 337	980 221	·827 663	019 779	45
6	·261 045	036 867	·152 558	980 539	·847 442	019 461	6
7	·297 912	037 357	·133 097	980 907	·866 903	019 093	7
8	·335 269	037 893	·114 004	981 284	·885 996	018 716	8
9	·373 162	038 480	·095 288	981 631	·904 712	018 369	9
50	·411 642	039 121	·076 919	981 812	·923 081	018 188	50
1	·450 763	039 813	·058 731	981 750	·941 269	018 250	1
2	·490 576	040 556	·040 481	981 525	·959 519	018 475	2
3	·531 132	041 354	·022 006	981 189	·977 994	018 811	3
4	·572 486	042 205	·003 195	980 670	·996 805	019 330	4

H^F.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·394 162	1·966 687	$\bar{4}$·605 838	0·033 313	4·385 309	956 878	55
6	·360 849	·966 330	·639 151	·033 670	·342 187	955 878	6
7	·327 179	·965 971	·672 821	·034 029	·298 065	954 785	7
8	·293 150	·965 591	·706 850	·034 409	·252 850	953 583	8
9	·258 741	·965 122	·741 259	·034 878	·206 433	952 262	9
60	·223 863	·964 286	·776 137	·035 714	·158 695	950 843	60
1	·188 149	·963 311	·811 851	·036 689	·109 538	949 325	1
2	·151 460	·962 156	·848 540	·037 844	·058 863	947 710	2
3	·113 616	·960 852	·886 384	·039 148	·006 573	945 999	3
4	·074 468	·959 442	·925 532	·040 558	3·952 572	944 187	4
65	·033 910	·958 151	·966 090	·041 849	·896 759	942 238	65
6	2·992 061	·956 885	$\bar{3}$·007 939	·043 115	·838 997	940 113	6
7	·948 946	·955 424	·051 054	·044 576	·779 110	937 802	7
8	·904 370	·953 794	·095 630	·046 206	·716 912	935 288	8
9	·858 164	·951 965	·141 836	·048 035	·652 200	932 546	9
70	·810 129	·949 831	·189 871	·050 169	·584 746	929 574	70
1	·759 960	·946 921	·240 040	·053 079	·514 320	926 446	1
2	·706 881	·943 563	·293 119	·056 437	·440 766	923 212	2
3	·650 444	·939 859	·349 556	·060 141	·363 978	919 919	3
4	·590 303	·935 756	·409 697	·064 244	·283 897	916 639	4
75	·526 059	·931 413	·473 941	·068 587	·200 536	913 448	75
6	·457 472	·926 980	·542 528	·073 020	·113 984	910 406	6
7	·384 452	·924 199	·615 548	·075 801	·024 390	907 183	7
8	·308 651	·921 611	·691 349	·078 389	2·931 573	903 673	8
9	·230 262	·919 503	·769 738	·080 497	·835 246	899 651	9
80	·149 765	·918 294	·850 235	·081 706	·734 897	894 672	80
1	·068 059	·917 407	·931 941	·082 593	·629 569	888 217	1
2	1·985 466	·913 365	$\bar{2}$·014 534	·086 635	·517 786	880 550	2
3	·898 831	·906 527	·101 169	·093 473	·398 336	871 991	3
4	·805 358	·897 524	·194 642	·102 476	·270 327	862 882	4
85	·702 882	·885 513	·297 118	·114 487	·133 209	854 170	85
6	·588 395	·871 144	·411 605	·128 856	1·987 379	847 207	6
7	·459 539	·857 240	·540 461	·142 760	·834 586	842 906	7
8	·316 779	·844 969	·683 221	·155 031	·677 492	842 004	8
9	·161 748	·836 496	·838 252	·163 504	·519 496	844 399	9
90	0·998 244	·835 008	$\bar{1}$·001 756	·164 992	·363 895	848 384	90
1	·833 252	·838 608	·166 748	·161 392	·212 279	852 403	1
2	·671 860	·860 056	·328 140	·139 944	·064 682	849 268	2
3	·531 916	·888 673	·468 084	·111 327	0·913 950	831 806	3
4	·420 589	·885 471	·579 411	·114 529	·745 756	803 913	4
95	·306 060	·873 103	·693 940	·126 897	·549 669	758 849	95
6	·179 163	·846 175	·820 837	·153 825	·308 518	680 356	6
7	·025 338	·795 717	·974 662	·204 283	$\bar{1}$·988 874	505 845	7
8	1·821 055	·673 664	0·178 945	·326 336	·494 719		8
9	·494 719		·505 281				9

H^F.

6 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·614 691	043 122	2·983 865	980 309	$\bar{3}$·016 135	019 691	55
6	·657 813	044 122	·964 174	980 070	·035 826	019 930	6
7	·701 935	045 215	·944 244	979 862	·055 756	020 138	7
8	·747 150	046 417	·924 106	979 653	·075 894	020 347	8
9	·793 567	047 738	·903 759	979 286	·096 241	020 714	9
60	·841 305	049 157	·883 045	978 196	·116 955	021 804	60
1	·890 462	050 675	·861 241	976 898	·138 759	023 102	1
2	·941 137	052 290	·838 139	975 322	·161 861	024 678	2
3	·993 427	054 001	·813 461	973 559	·186 539	026 441	3
4	$\bar{4}$·047 428	055 813	·787 020	971 689	·212 980	028 311	4
65	·103 241	057 762	·758 709	970 138	·241 291	029 862	65
6	·161 003	059 887	·728 847	968 723	·271 153	031 277	6
7	·220 890	062 198	·697 570	967 060	·302 430	032 940	7
8	·283 088	064 712	·664 630	965 212	·335 370	034 788	8
9	·347 800	067 454	·629 842	963 137	·370 158	036 863	9
70	·415 254	070 426	·592 979	960 686	·407 021	039 314	70
1	·485 680	073 554	·553 665	957 141	·446 335	042 859	1
2	·559 234	076 788	·510 806	953 036	·489 194	046 964	2
3	·636 022	080 081	·463 842	948 537	·536 158	051 463	3
4	·716 103	083 361	·412 379	943 561	·587 621	056 439	4
75	·799 464	086 552	·355 940	938 322	·644 060	061 678	75
6	·886 016	089 594	·294 262	933 016	·705 738	066 984	6
7	·975 610	092 817	·227 278	930 079	·772 722	069 921	7
8	$\bar{3}$·068 427	096 327	·157 357	927 486	·842 643	072 514	8
9	·164 754	100 349	·084 843	925 641	·915 157	074 359	9
80	·265 103	105 328	·010 484	925 140	·989 516	074 860	80
1	·370 431	111 783	1·935 624	925 233	$\bar{2}$·064 376	074 767	1
2	·482 214	119 450	·860 857	921 410	·139 143	078 590	2
3	·601 664	128 009	·782 267	914 222	·217 733	085 778	3
4	·729 673	137 118	·696 489	904 531	·303 511	095 469	4
85	·866 791	145 830	·601 020	891 303	·398 980	108 697	85
6	$\bar{2}$·012 621	152 793	·492 323	875 247	·507 677	124 753	6
7	·165 414	157 094	·367 570	859 573	·632 430	140 427	7
8	·322 508	157 996	·227 143	845 440	·772 857	154 560	8
9	·480 504	155 601	·072 583	835 231	·927 417	164 769	9
90	·636 105	151 616	0·907 814	832 805	$\bar{1}$·092 186	167 195	90
1	·787 721	147 597	·740 619	836 252	·259 381	163 748	1
2	·935 318	150 732	·576 871	861 905	·423 129	138 095	2
3	$\bar{1}$·086 050	168 194	·438 776	897 592	·561 224	102 408	3
4	·254 244	196 087	·336 368	896 143	·663 632	103 857	4
95	·450 331	241 151	·232 511	884 748	·767 489	115 252	95
6	·691 482	319 644	·117 259	858 128	·882 741	141 872	6
7	0·011 126	494 155	$\bar{1}$·975 387	807 894	0·024 613	192 106	7
8	·505 281		·783 281	686 133	·216 719	313 867	8
9			·469 414		·530 586		9

H^F.

6 PER CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	14·3241	·132597	·008653	55	9·7982	·388780	·036004
1	14·2314	·137846	·009050	6	9·5794	·401167	·037920
2	14·1491	·142504	·009407	7	9·3516	·414061	·040000
3	14·0755	·146670	·009729	8	9·1138	·427520	·042271
4	14·0083	·150472	·010026	9	8·8653	·441589	·044762
15	13·9450	·154055	·010308	60	8·6066	·456229	·047491
6	13·8835	·157537	·010585	1	8·3443	·471078	·050413
7	13·8210	·161075	·010868	2	8·0798	·486047	·053530
8	13·7546	·164836	·011172	3	7·8155	·501009	·056833
9	13·6811	·168992	·011511	4	7·5527	·515884	·060318
20	13·5997	·173599	·011891	65	7·2920	·530639	·063994
1	13·5156	·178365	·012288	6	7·0297	·545489	·067934
2	13·4317	·183112	·012688	7	6·7634	·560563	·072206
3	13·3513	·187663	·013076	8	6·4945	·575785	·076828
4	13·2783	·191792	·013432	9	6·2235	·591123	·081833
25	13·2150	·195380	·013745	70	5·9514	·606527	·087253
6	13·1610	·198435	·014013	1	5·6802	·621879	·093093
7	13·1112	·201253	·014262	2	5·4186	·636685	·099194
8	13·0641	·203922	·014500	3	5·1705	·650726	·105457
9	13·0163	·206626	·014742	4	4·9385	·663859	·111789
30	12·9641	·209577	·015008	75	4·7258	·675898	·118044
1	12·9068	·212823	·015304	6	4·5343	·686737	·124087
2	12·8433	·216419	·015634	7	4·3645	·696347	·129806
3	12·7732	·220384	·016001	8	4·1968	·705840	·135821
4	12·6993	·224568	·016393	9	4·0270	·715452	·142321
35	12·6209	·229006	·016813	80	3·8471	·725637	·149706
6	12·5373	·233735	·017266	1	3·6434	·737165	·158755
7	12·4496	·238700	·017748	2	3·4066	·750571	·170329
8	12·3575	·243916	·018261	3	3·1587	·764603	·183857
9	12·2606	·249401	·018808	4	2·9172	·778271	·198679
40	12·1586	·255174	·019392	85	2·6936	·790931	·214138
1	12·0519	·261214	·020014	6	2·5060	·801547	·228620
2	11·9400	·267550	·020676	7	2·3716	·809154	·239989
3	11·8222	·274212	·021386	8	2·2946	·813512	·246921
4	11·6986	·281214	·022145	9	2·2790	·814395	·248365
45	11·5687	·288567	·022959	90	2·3209	·812027	·244522
6	11·4321	·296298	·023833	1	2·3935	·807918	·238081
7	11·2871	·304503	·024782	2	2·4707	·803545	·231522
8	11·1328	·313239	·025818	3	2·4101	·806976	·236643
9	10·9684	·322546	·026950	4	2·1143	·823720	·264496
50	10·7935	·332446	·028189	95	1·7523	·844210	·306729
1	10·6089	·342896	·029537	6	1·3470	·867154	·369479
2	10·4161	·353804	·030992	7	·9195	·891352	·464375
3	10·2163	·365116	·032552	8	·4717	·916697	·622884
4	10·0099	·376799	·034224	9	·0000	·943397	·943397

III.

$H^{M(5)}$.

HEALTHY MALE LIVES,

OMITTING THE

FIRST FIVE YEARS OF ASSURANCE.

HM(5).

Elementary Values.

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
10	10 000	4·000 000	$\bar{1}$·998 259	000 256	$\bar{4}$·000 000	10
1	9 960	3·998 259	·998 515	000 171	·001 741	1
2	9 926	·996 774	·998 686	000 039	·003 226	2
3	9 896	·995 460	·998 725	999 953	·004 540	3
4	9 867	·994 185	·998 678	999 907	·005 815	4
15	9 837	·992 863	·998 585	999 773	·007 137	15
6	9 805	·991 448	·998 358	999 726	·008 552	6
7	9 768	·989 806	·998 084	999 542	·010 194	7
8	9 725	·987 890	·997 626	999 446	·012 110	8
9	9 672	·985 516	·997 072	999 296	·014 484	9
20	9 607	·982 588	·996 368	999 418	·017 412	20
1	9 527	·978 956	·995 786	999 726	·021 044	1
2	9 435	·974 742	·995 512	999 812	·025 258	2
3	9 338	·970 254	·995 324	999 949	·029 746	3
4	9 238	·965 578	·995 273	000 141	·034 422	4
25	9 138	·960 851	·995 414	000 193	·039 149	25
6	9 042	·956 265	·995 607	000 053	·043 735	6
7	8 951	·951 872	·995 660	000 105	·048 128	7
8	8 862	·947 532	·995 765	000 108	·052 468	8
9	8 776	·943 297	·995 873	000 111	·056 703	9
30	8 693	·939 170	·995 984	000 015	·060 830	30
1	8 613	·935 154	·995 999	999 962	·064 846	1
2	8 534	·931 153	·995 961	000 014	·068 847	2
3	8 455	·927 114	·995 975	999 909	·072 886	3
4	8 377	·923 089	·995 884	999 751	·076 911	4
35	8 298	·918 973	·995 635	999 848	·081 027	35
6	8 215	·914 608	·995 483	999 844	·085 392	6
7	8 130	·910 091	·995 327	999 841	·089 909	7
8	8 043	·905 418	·995 168	999 945	·094 582	8
9	7 954	·900 586	·995 113	999 944	·099 414	9
40	7 865	·895 699	·995 057	000 000	·104 301	40
1	7 776	·890 756	·995 057	999 886	·109 244	1
2	7 688	·885 813	·994 943	999 883	·114 187	2
3	7 599	·880 756	·994 826	999 820	·119 244	3
4	7 509	·875 582	·994 646	999 696	·124 418	4
45	7 417	·870 228	·994 342	999 685	·129 772	45
6	7 321	·864 570	·994 027	999 673	·135 430	6
7	7 221	·858 597	·993 700	999 597	·141 403	7
8	7 117	·852 297	·993 297	999 580	·147 703	8
9	7 008	·845 594	·992 877	999 625	·154 406	9
50	6 894	·838 471	·992 502	999 608	·161 529	50
1	6 776	·830 973	·992 110	999 654	·169 027	1
2	6 654	·823 083	·991 764	999 501	·176 917	2
3	6 529	·814 847	·991 265	999 544	·185 153	3
4	6 399	·806 112	·990 809	999 447	·193 888	4

H^{M}(5).

Elementary Values.

x	Colog p_x	Δ	d_x	Log d_x	Δ	$-\Delta$	x
10	0·001 741	999 744	40	1·602 060	929 419	070 581	10
1	·001 485	999 829	34	·531 479	945 642	054 358	1
2	·001 314	999 961	30	·477 121	985 277	014 723	2
3	·001 275	000 047	29	·462 398	014 723	985 277	3
4	·001 322	000 093	30	·477 121	028 029	971 971	4
15	·001 415	000 227	32	·505 150	063 052	936 948	15
6	·001 642	000 274	37	·568 202	065 266	934 734	6
7	·001 916	000 458	43	·633 468	090 808	909 192	7
8	·002 374	000 554	53	·724 276	088 637	911 363	8
9	·002 928	000 704	65	·812 913	090 177	909 823	9
20	·003 632	000 582	80	·903 090	060 698	939 302	20
1	·004 214	000 274	92	·963 788	022 984	977 016	1
2	·004 488	000 188	97	·986 772	013 228	986 772	2
3	·004 676	000 051	100	2·000 000	000 000	000 000	3
4	·004 727	999 859	100	·000 000	982 271	017 729	4
25	·004 586	999 807	96	1·982 271	976 770	023 230	25
6	·004 393	999 947	91	·959 041	990 349	009 651	6
7	·004 340	999 895	89	·949 390	985 108	014 892	7
8	·004 235	999 892	86	·934 498	984 580	015 420	8
9	·004 127	999 889	83	·919 078	984 012	015 988	9
30	·004 016	999 985	80	·903 090	994 537	005 463	30
1	·004 001	000 038	79	·897 627	000 000	000 000	1
2	·004 039	999 986	79	·897 627	994 468	005 532	2
3	·004 025	000 091	78	·892 095	005 532	994 468	3
4	·004 116	000 249	79	·897 627	021 451	978 549	4
35	·004 365	000 152	83	·919 078	010 341	989 659	35
6	·004 517	000 156	85	·929 419	010 100	989 900	6
7	·004 673	000 159	87	·939 519	009 871	990 129	7
8	·004 832	000 055	89	·949 390	000 000	000 000	8
9	·004 887	000 056	89	·949 390	000 000	000 000	9
40	·004 943	000 000	89	·949 390	995 093	004 907	40
1	·004 943	000 114	88	·944 483	004 907	995 093	1
2	·005 057	000 117	89	·949 390	004 853	995 147	2
3	·005 174	000 180	90	·954 243	009 545	990 455	3
4	·005 354	000 304	92	·963 788	018 483	981 517	4
45	·005 658	000 315	96	·982 271	017 729	982 271	45
6	·005 973	000 327	100	2·000 000	017 033	982 967	6
7	·006 300	000 403	104	·017 033	020 393	979 607	7
8	·006 703	000 420	109	·037 426	019 479	980 521	8
9	·007 123	000 375	114	·056 905	014 977	985 023	9
50	·007 498	000 392	118	·071 882	014 478	985 522	50
1	·007 890	000 346	122	·086 360	010 550	989 450	1
2	·008 236	000 499	125	·096 910	017 033	982 967	2
3	·008 735	000 456	130	·113 943	013 162	986 838	3
4	·009 191	000 553	134	·127 105	015 910	984 090	4

$H^{M(5)}$.

Elementary Values—(continued).

x	l_x	Log l_x	Log p_x	Δ	Colog l_x	x
55	6 265	3·796 921	1·990 256	999 413	4·203 079	55
6	6 126	·787 177	·989 669	999 303	·212 823	6
7	5 982	·776 846	·988 972	999 329	·223 154	7
8	5 832	·765 818	·988 301	999 204	·234 182	8
9	5 677	·754 119	·987 505	998 981	·245 881	9
60	5 516	·741 624	·986 486	998 979	·258 376	60
1	5 347	·728 110	·985 465	998 799	·271 890	1
2	5 171	·713 575	·984 264	998 686	·286 425	2
3	4 987	·697 839	·982 950	998 547	·302 161	3
4	4 795	·680 789	·981 497	998 682	·319 211	4
65	4 595	·662 286	·980 179	998 532	·337 714	65
6	4 390	·642 465	·978 711	998 575	·357 535	6
7	4 180	·621 176	·977 286	998 399	·378 824	7
8	3 967	·598 462	·975 685	998 312	·401 538	8
9	3 751	·574 147	·973 997	997 818	·425 853	9
70	3 533	·548 144	·971 815	997 340	·451 856	70
1	3 311	·519 959	·969 155	996 728	·480 041	1
2	3 084	·489 114	·965 883	996 259	·510 886	2
3	2 851	·454 997	·962 142	995 834	·545 003	3
4	2 613	·417 139	·957 976	996 510	·582 861	4
75	2 372	·375 115	·954 486	995 808	·624 885	75
6	2 136	·329 601	·950 294	996 411	·670 399	6
7	1 905	·279 895	·946 705	995 487	·720 105	7
8	1 685	·226 600	·942 192	994 867	·773 400	8
9	1 475	·168 792	·937 059	994 516	·831 208	9
80	1 276	·105 851	·931 575	993 368	·894 149	80
1	1 090	·037 426	·924 943	992 930	·962 574	1
2	917	2·962 369	·917 873	992 873	3·037 631	2
3	759	·880 242	·910 746	992 871	·119 758	3
4	618	·790 988	·903 617	993 955	·209 012	4
85	495	·694 605	·897 572	994 551	·305 395	85
6	391	·592 177	·892 123	992 793	·407 823	6
7	305	·484 300	·884 916	993 841	·515 700	7
8	234	·369 216	·878 757	990 541	·630 784	8
9	177	·247 973	·869 298	986 559	·752 027	9
90	131	·117 271	·855 857	977 195	·882 729	90
1	94	1·973 128	·833 052	973 552	$\bar{2}$·026 872	1
2	64	·806 180	·806 604	942 340	·193 820	2
3	41	·612 784	·748 944	930 721	·387 216	3
4	23	·361 728	·679 665	881 002	·638 272	4
95	11	·041 393	·560 667		·958 607	95
6	4	0·602 060			$\bar{1}$·397 940	6

HM(5).

Elementary Values—(continued).

x	Colog p_x	Δ	d_x	Log d_x	Δ	$-\Delta$	x
55	0·009 744	000 587	139	2·143 015	015 347	984 653	55
6	·010 331	000 697	144	·158 362	017 729	982 271	6
7	·011 028	000 671	150	·176 091	014 241	985 759	7
8	·011 699	000 796	155	·190 332	016 494	983 506	8
9	·012 495	001 019	161	·206 826	021 061	978 939	9
60	·013 514	001 021	169	·227 887	017 626	982 374	60
1	·014 535	001 201	176	·245 513	019 305	980 695	1
2	·015 736	001 314	184	·264 818	018 483	981 517	2
3	·017 050	001 453	192	·283 301	017 729	982 271	3
4	·018 503	001 318	200	·301 030	010 724	989 276	4
65	·019 821	001 468	205	·311 754	010 465	989 535	65
6	·021 289	001 425	210	·322 219	006 161	993 839	6
7	·022 714	001 601	213	·328 380	006 074	993 926	7
8	·024 315	001 688	216	·334 454	004 002	995 998	8
9	·026 003	002 182	218	·338 456	007 897	992 103	9
70	·028 185	002 660	222	·346 353	009 673	990 327	70
1	·030 845	003 272	227	·356 026	011 330	988 670	1
2	·034 117	003 741	233	·367 356	009 221	990 779	2
3	·037 858	004 166	238	·376 577	005 440	994 560	3
4	·042 024	003 490	241	·382 017	990 895	009 105	4
75	·045 514	004 192	236	·372 912	990 700	009 300	75
6	·049 706	003 589	231	·363 612	978 811	021 189	6
7	·053 295	004 513	220	·342 423	979 796	020 204	7
8	·057 808	005 133	210	·322 219	976 634	023 366	8
9	·062 941	005 484	199	·298 853	970 660	029 340	9
80	·068 425	006 632	186	·269 513	968 533	031 467	80
1	·075 057	007 070	173	·238 046	960 611	039 389	1
2	·082 127	007 127	158	·198 657	950 562	049 438	2
3	·089 254	007 129	141	·149 219	940 686	059 314	3
4	·096 383	006 045	123	·089 905	927 128	072 872	4
85	·102 428	005 449	104	·017 033	917 465	082 535	85
6	·107 877	007 207	86	1·934 498	916 760	083 240	6
7	·115 084	006 159	71	·851 258	904 617	095 383	7
8	·121 243	009 459	57	·755 875	906 883	093 117	8
9	·130 702	013 441	46	·662 758	905 444	094 556	9
90	·144 143	022 805	37	·568 202	908 919	091 081	90
1	·166 948	026 448	30	·477 121	884 607	115 393	1
2	·193 396	057 660	23	·361 728	893 545	106 455	2
3	·251 056	069 279	18	·255 273	823 908	176 092	3
4	·320 335	118 998	12	·079 181	765 917	234 083	4
95	·439 333		7	·845 098	756 962	243 038	95
6			4	·602 060			6

$H^{M(5)}$.

Probabilities of Living over, and of Dying in, a Year, and the Average Duration of Life, at each Age.

x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$	x	p_x	q_x $(1-p_x)$	$\mathring{e}_x$
10	·996 000	·004 000	48·463	55	·977 813	·022 187	16·767
1	·996 586	·003 414	47·656	6	·976 494	·023 506	16·136
2	·996 978	·003 022	46·817	7	·974 925	·025 075	15·512
3	·997 069	·002 931	45·958	8	·973 423	·026 577	14·898
4	·996 960	·003 040	45·091	9	·971 640	·028 360	14·291
15	·996 747	·003 253	44·227	60	·969 362	·030 638	13·694
6	·996 226	·003 774	43·370	1	·967 084	·032 916	13·111
7	·995 598	·004 402	42·532	2	·964 417	·035 583	12·540
8	·994 550	·005 450	41·718	3	·961 500	·038 500	11·984
9	·993 280	·006 720	40·944	4	·958 290	·041 710	11·444
20	·991 673	·008 327	40·218	65	·955 386	·044 614	10·921
1	·990 343	·009 657	39·551	6	·952 164	·047 836	10·407
2	·989 719	·010 281	38·932	7	·949 043	·050 957	9·905
3	·989 291	·010 709	38·331	8	·945 551	·054 449	9·410
4	·989 175	·010 825	37·741	9	·941 882	·058 118	8·923
25	·989 494	·010 506	37·148	70	·937 164	·062 836	8·443
6	·989 936	·010 064	36·537	1	·931 441	·068 559	7·975
7	·990 057	·009 943	35·904	2	·924 449	·075 551	7·526
8	·990 296	·009 704	35·259	3	·916 520	·083 480	7·100
9	·990 542	·009 458	34·600	4	·907 769	·092 231	6·701
30	·990 797	·009 203	33·926	75	·900 506	·099 494	6·331
1	·990 828	·009 172	33·236	6	·891 854	·108 146	5·975
2	·990 743	·009 257	32·539	7	·884 514	·115 486	5·639
3	·990 775	·009 225	31·838	8	·875 371	·124 629	5·310
4	·990 569	·009 431	31·130	9	·865 085	·134 915	4·995
35	·989 998	·010 002	30·422	80	·854 232	·145 768	4·696
6	·989 653	·010 347	29·724	1	·841 284	·158 716	4·412
7	·989 299	·010 701	29·029	2	·827 699	·172 301	4·150
8	·988 935	·011 065	28·338	3	·814 230	·185 770	3·910
9	·988 811	·011 189	27·650	4	·800 970	·199 030	3·688
40	·988 684	·011 316	26·957	85	·789 899	·210 101	3·480
1	·988 683	·011 317	26·260	6	·780 051	·219 949	3·272
2	·988 424	·011 576	25·555	7	·767 213	·232 787	3·054
3	·988 156	·011 844	24·848	8	·756 410	·243 590	2·829
4	·987 748	·012 252	24·140	9	·740 112	·259 888	2·579
45	·987 057	·012 943	23·433	90	·717 557	·282 443	2·309
6	·986 341	·013 659	22·734	1	·680 851	·319 149	2·021
7	·985 598	·014 402	22·042	2	·640 625	·359 375	1·734
8	·984 685	·015 315	21·357	3	·560 974	·439 026	1·427
9	·983 733	·016 267	20·681	4	·478 262	·521 738	1·152
50	·982 884	·017 116	20·015	95	·363 637	·636 363	·864
1	·981 995	·018 005	19·354	6	·000 000	1·000 000	·500
2	·981 214	·018 786	18·700				
3	·980 089	·019 911	18·049				
4	·979 059	·020 941	17·405				

$H^{M}(5)$.

THREE PER-CENT.

HM(5).

3 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	7 440·94	175 322·2	3 487 413·4	2 117·74	75 864·78	10
1	7 195·32	168 126·9	3 312 091·2	2 088·84	73 747·04	1
2	6 961·90	161 165·0	3 143 964·3	2 065·00	71 658·19	2
3	6 738·69	154 426·3	2 982 799·4	2 044·57	69 593·19	3
4	6 523·25	147 903·0	2 828 373·1	2 025·40	67 548·62	4
15	6 314·00	141 589·0	2 680 470·1	2 006·14	65 523·23	15
6	6 110·15	135 478·9	2 538 881·0	1 986·20	63 517·09	6
7	5 909·80	129 569·1	2 403 402·2	1 963·81	61 530·89	7
8	5 712·41	123 856·7	2 273 833·1	1 938·56	59 567·07	8
9	5 515·81	118 340·9	2 149 976·4	1 908·33	57 628·52	9
20	5 319·16	113 021·7	2 031 635·6	1 872·34	55 720·19	20
1	5 121·23	107 900·5	1 918 613·9	1 829·34	53 847·85	1
2	4 924·06	102 976·4	1 810 713·4	1 781·32	52 018·51	2
3	4 731·49	98 244·92	1 707 737·0	1 732·17	50 237·18	3
4	4 544·48	93 700·44	1 609 492·1	1 682·98	48 505·01	4
25	4 364·36	89 336·08	1 515 791·6	1 635·22	46 822·03	25
6	4 192·73	85 143·35	1 426 455·5	1 590·71	45 186·81	6
7	4 029·64	81 113·71	1 341 312·2	1 549·74	43 596·10	7
8	3 873·37	77 240·33	1 260 198·5	1 510·84	42 046·36	8
9	3 724·06	73 516·27	1 182 958·2	1 474·35	40 535·52	9
30	3 581·40	69 934·87	1 109 441·9	1 440·15	39 061·18	30
1	3 445·09	66 489·78	1 039 507·0	1 408·15	37 621·03	1
2	3 314·07	63 175·71	973 017·2	1 377·47	36 212·88	2
3	3 187·76	59 987·95	909 841·5	1 347·69	34 835·40	3
4	3 066·36	56 921·60	849 853·6	1 319·14	33 487·72	4
35	2 948·97	53 972·63	792 932·0	1 291·06	32 168·58	35
6	2 834·44	51 138·18	738 959·3	1 262·42	30 877·52	6
7	2 723·41	48 414·77	687 821·2	1 233·95	29 615·10	7
8	2 615·79	45 798·98	639 406·4	1 205·65	28 381·15	8
9	2 511·50	43 287·47	593 607·4	1 177·55	27 175·49	9
40	2 411·07	40 876·41	550 319·9	1 150·27	25 997·94	40
1	2 314·36	38 562·05	509 443·5	1 123·78	24 847·67	1
2	2 221·52	36 340·53	470 881·5	1 098·35	23 723·89	2
3	2 131·85	34 208·69	434 541·0	1 073·38	22 625·54	3
4	2 045·24	32 163·45	400 332·3	1 048·87	21 552·15	4
45	1 961·34	30 202·10	368 168·8	1 024·54	20 503·28	45
6	1 879·57	28 322·54	337 966·7	999·895	19 478·74	6
7	1 799·90	26 522·64	309 644·2	974·969	18 478·85	7
8	1 722·31	24 800·33	283 121·5	949·801	17 503·88	8
9	1 646·53	23 153·80	258 321·2	924·192	16 554·08	9
50	1 572·57	21 581·23	235 167·4	898·188	15 629·88	50
1	1 500·63	20 080·60	213 586·2	872·055	14 731·70	1
2	1 430·70	18 649·90	193 505·6	845·823	13 859·64	2
3	1 362·93	17 286·97	174 855·7	819·730	13 013·82	3
4	1 296·89	15 990·08	157 568·7	793·383	12 194·09	4

$H^{M(5)}$.

3 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	1 232·75	14 757·34	141 578·6	767·016	11 400·71	55
6	1 170·29	13 587·05	126 821·3	740·462	10 633·69	6
7	1 109·49	12 477·56	113 234·2	713·754	9 893·228	7
8	1 050·17	11 427·39	100 756·7	686·743	9 179·474	8
9	992·482	10 434·91	89 329·28	659·645	8 492·731	9
60	936·248	9 498·661	78 894·37	632·318	7 833·085	60
1	881·129	8 617·532	69 395·71	604·469	7 200·767	1
2	827·307	7 790·225	60 778·18	576·311	6 596·298	2
3	774·630	7 015·596	52 987·95	547·730	6 019·987	3
4	723·113	6 292·483	45 972·35	518·775	5 472·257	4
65	672·769	5 619·714	39 679·87	489·493	4 953·482	65
6	624·033	4 995·680	34 060·16	460·352	4 463·989	6
7	576·876	4 418·805	29 064·48	431·370	4 003·637	7
8	531·534	3 887·271	24 645·67	402·831	3 572·267	8
9	487·954	3 399·317	20 758·40	374·732	3 169·436	9
70	446·209	2 953·109	17 359·08	347·199	2 794·704	70
1	405·991	2 547·118	14 405·98	319·978	2 447·504	1
2	367·142	2 179·976	11 858·86	292·954	2 127·526	2
3	329·519	1 850·457	9 678·882	266·024	1 834·572	3
4	293·214	1 557·243	7 828·425	239·317	1 568·548	4
75	258·418	1 298·825	6 271·181	213·061	1 329·231	75
6	225·929	1 072·896	4 972·356	188·099	1 116·169	6
7	195·627	877·269 2	3 899·460	164·378	928·070	7
8	167·995	709·274 2	3 022·191	142·443	763·693	8
9	142·775	566·499 5	2 312·917	122·116	621·249	9
80	119·915	466·584 7	1 746·417	103·415	499·133	80
1	99·451 5	347·133 2	1 299·833	86·444 2	395·718	1
2	81·230 1	265·903 1	952·699	71·119 4	309·274	2
3	65·275 8	200·627 3	686·796	57·531 0	238·155	3
4	51·601 4	149·025 9	486·169	45·757 9	180·624	4
85	40·127 4	108·898 5	337·143	35·786 9	134·866	85
6	30·773 4	78·125 1	228·245	27·601 6	99·079	6
7	23·305 7	54·819 4	150·120	21·030 2	71·477	7
8	17·359 6	37·459 8	95·300	15·762 9	50·447	8
9	12·748 5	24·711 3	57·840	11·657 5	34·684	9
90	9·160 5	15·550 7	33·129	8·440 8	23·027	90
1	6·381 8	9·169 0	17·578	5·928 8	14·586	1
2	4·218 5	4·950 5	8·409	3·951 4	8·657	2
3	2·623 8	2·326 8	3·459	2·479 6	4·706	3
4	1·429 0	·897 8	1·132	1·361 2	2·226	4
95	·663 5	·234 3	·234	·637 4	·865	95
6	·234 3	·000 0	·000	·227 4	·227	6

$H^{M(5)}$.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	3·871 628	$\bar{1}$·985 422	$\bar{4}$·128 372	0·014 578	5·243 837	981 800	10
1	·857 050	·985 678	·142 950	·014 322	·225 637	981 634	1
2	·842 728	·985 848	·157 272	·014 152	·207 271	981 450	2
3	·828 576	·985 888	·171 424	·014 112	·188 721	981 256	3
4	·814 464	·985 840	·185 536	·014 160	·169 977	981 053	4
15	·800 304	·985 748	·199 696	·014 252	·151 030	980 842	15
6	·786 052	·985 521	·213 948	·014 479	·131 872	980 630	6
7	·771 573	·985 247	·228 427	·014 753	·112 502	980 418	7
8	·756 820	·984 789	·243 180	·015 211	·092 920	980 215	8
9	·741 609	·984 234	·258 391	·015 766	·073 135	980 027	9
20	·725 843	·983 532	·274 157	·016 468	·053 162	979 861	20
1	·709 375	·982 948	·290 625	·017 052	·033 023	879 715	1
2	·692 323	·982 675	·307 677	·017 325	·012 738	979 572	2
3	·674 998	·982 487	·325 002	·017 513	4·992 310	979 432	3
4	·657 485	·982 436	·342 515	·017 564	·971 742	979 285	4
25	·639 921	·982 576	·360 079	·017 424	·951 027	979 124	25
6	·622 497	·982 770	·377 503	·017 230	·930 151	978 943	6
7	·605 267	·982 822	·394 733	·017 178	·909 094	978 750	7
8	·588 089	·982 928	·411 911	·017 072	·887 844	978 540	8
9	·571 017	·983 036	·428 983	·016 964	·866 384	978 310	9
30	·554 053	·983 147	·445 947	·016 853	·844 694	978 061	30
1	·537 200	·983 161	·462 800	·016 839	·822 755	977 795	1
2	·520 361	·983 124	·479 639	·016 876	·800 550	977 514	2
3	·503 485	·983 138	·496 515	·016 862	·778 064	977 213	3
4	·486 623	·983 048	·513 377	·016 952	·755 277	976 897	4
35	·469 671	·982 797	·530 329	·017 203	·732 174	976 571	35
6	·452 468	·982 645	·547 532	·017 355	·708 745	976 233	6
7	·435 113	·982 491	·564 887	·017 509	·684 978	975 878	7
8	·417 604	·982 330	·582 396	·017 670	·660 856	975 506	8
9	·399 934	·982 276	·600 066	·017 724	·636 362	975 111	9
40	·382 210	·982 220	·617 790	·017 780	·611 473	974 687	40
1	·364 430	·982 220	·635 570	·017 780	·586 160	974 231	1
2	·346 650	·982 106	·653 350	·017 894	·560 391	973 745	2
3	·328 756	·981 988	·671 244	·018 012	·534 136	973 227	3
4	·310 744	·981 809	·689 256	·018 191	·507 363	972 674	4
45	·292 553	·981 505	·707 447	·018 495	·480 037	972 095	45
6	·274 058	·981 190	·725 942	·018 810	·452 132	971 485	6
7	·255 248	·980 862	·744 752	·019 138	·423 617	970 841	7
8	·236 110	·980 460	·763 890	·019 540	·394 458	970 164	8
9	·216 570	·980 040	·783 430	·019 960	·364 622	969 454	9
50	·196 610	·979 665	·803 390	·020 335	·334 076	968 701	50
1	·176 275	·979 272	·823 725	·020 728	·302 777	967 900	1
2	·155 547	·978 927	·844 453	·021 073	·270 677	967 042	2
3	·134 474	·978 428	·865 526	·021 572	·237 719	966 132	3
4	·112 902	·977 972	·887 098	·022 028	·203 851	965 157	4

HM(5).

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{6}$·756 163	018 200	3·325 873	994 033	$\bar{4}$·674 127	005 967	10
1	·774 363	018 366	·319 906	995 014	·680 094	004 986	1
2	·792 729	018 550	·314 920	995 682	·685 080	004 318	2
3	·811 279	018 744	·310 602	995 908	·689 398	004 092	3
4	·830 023	018 947	·306 510	995 852	·693 490	004 148	4
15	·848 970	019 158	·302 362	995 661	·697 638	004 339	15
6	·868 128	019 370	·298 023	995 077	·701 977	004 923	6
7	·887 498	019 582	·293 100	994 378	·706 900	005 622	7
8	·907 080	019 785	·287 478	993 176	·712 522	006 824	8
9	·926 865	019 973	·280 654	991 731	·719 346	008 269	9
20	·946 838	020 139	·272 385	989 909	·727 615	010 091	20
1	·966 977	020 285	·262 294	988 449	·737 706	011 551	1
2	·987 262	020 428	·250 743	987 849	·749 257	012 151	2
3	$\bar{5}$·007 690	020 568	·238 592	987 487	·761 408	012 513	3
4	·028 258	020 715	·226 079	987 498	·773 921	012 502	4
25	·048 973	020 876	·213 577	988 013	·786 423	011 987	25
6	·069 849	021 057	·201 590	988 669	·798 410	011 331	6
7	·090 906	021 250	·190 259	988 959	·809 741	011 041	7
8	·112 156	021 460	·179 218	989 381	·820 782	010 619	8
9	·133 616	021 690	·168 599	989 809	·831 401	010 191	9
30	·155 306	021 939	·158 408	990 241	·841 592	009 759	30
1	·177 245	022 205	·148 649	990 434	·851 351	009 566	1
2	·199 450	022 486	·139 083	990 506	·860 917	009 494	2
3	·221 936	022 787	·129 589	990 701	·870 411	009 299	3
4	·244 723	023 103	·120 290	990 657	·879 710	009 343	4
35	·267 826	023 429	·110 947	990 258	·889 053	009 742	35
6	·291 255	023 767	·101 205	990 093	·898 795	009 907	6
7	·315 022	024 122	·091 298	989 925	·908 702	010 075	7
8	·339 144	024 494	·081 223	989 758	·918 777	010 242	8
9	·363 638	024 889	·070 981	989 818	·929 019	010 182	9
40	·388 527	025 313	·060 799	989 882	·939 201	010 118	40
1	·413 840	025 769	·050 681	990 061	·949 319	009 939	1
2	·439 609	026 255	·040 742	990 013	·959 258	009 987	2
3	·465 864	026 773	·030 755	989 967	·969 245	010 033	3
4	·492 637	027 326	·020 722	989 808	·979 278	010 192	4
45	·519 963	027 905	·010 530	989 425	·989 470	010 575	45
6	·547 868	028 515	2·999 955	989 036	$\bar{3}$·000 045	010 964	6
7	·576 383	029 159	·988 991	988 642	·011 009	011 358	7
8	·605 542	029 836	·977 633	988 129	·022 367	011 871	8
9	·635 378	030 546	·965 762	987 605	·034 238	012 395	9
50	·665 924	031 299	·953 367	987 177	·046 633	012 823	50
1	·697 223	032 100	·940 544	986 736	·059 456	013 264	1
2	·729 323	032 958	·927 280	986 391	·072 720	013 609	2
3	·762 281	033 868	·913 671	985 812	·086 329	014 188	3
4	·796 149	034 843	·899 483	985 321	·100 517	014 679	4

$H^{M(5)}$.

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	3·090 874	1·977 418	4·909 126	0·022 582	4·169 008	964 117	55
6	·068 292	·976 833	·931 708	·023 167	·133 125	963 005	6
7	·045 125	·976 134	·954 875	·023 866	·096 130	961 817	7
8	·021 259	·975 464	·978 741	·024 536	·057 947	960 542	8
9	2·996 723	·974 668	3·003 277	·025 332	·018 489	959 173	9
60	·971 391	·973 649	·028 609	·026 351	3·977 662	957 721	60
1	·945 040	·972 627	·054 960	·027 373	·935 383	956 167	1
2	·917 667	·971 427	·082 333	·028 573	·891 550	954 515	2
3	·889 094	·970 112	·110 906	·029 888	·846 065	952 757	3
4	·859 206	·968 660	·140 794	·031 340	·798 822	950 892	4
65	·827 866	·967 342	·172 134	·032 658	·749 714	948 881	65
6	·795 208	·965 874	·204 792	·034 126	·698 595	946 710	6
7	·761 082	·964 449	·238 918	·035 551	·645 305	944 340	7
8	·725 531	·962 848	·274 469	·037 152	·589 645	941 747	8
9	·688 379	·961 159	·311 621	·038 841	·531 392	938 888	9
70	·649 538	·958 978	·350 462	·041 022	·470 280	935 769	70
1	·608 516	·956 318	·391 484	·043 682	·406 049	932 403	1
2	·564 834	·953 046	·435 166	·046 954	·338 452	928 827	2
3	·517 880	·949 305	·482 120	·050 695	·267 279	925 077	3
4	·467 185	·945 138	·532 815	·054 862	·192 356	921 195	4
75	·412 323	·941 649	·587 677	·058 351	·113 551	917 007	75
6	·353 972	·937 457	·646 028	·062 543	·030 558	912 575	6
7	·291 429	·933 867	·708 571	·066 133	2·943 133	907 681	7
8	·225 296	·929 355	·774 704	·070 645	·850 814	902 386	8
9	·154 651	·924 222	·845 349	·075 778	·753 200	896 704	9
80	·078 873	·918 738	·921 127	·081 262	·649 904	890 592	80
1	1·997 611	·912 106	$\bar{2}$·002 389	·087 894	·540 496	884 227	1
2	·909 717	·905 035	·090 283	·094 965	·424 723	877 667	2
3	·814 752	·897 910	·185 248	·102 090	·302 390	870 872	3
4	·712 662	·890 779	·287 338	·109 221	·173 262	863 760	4
85	·603 441	·884 735	·396 559	·115 265	·037 022	855 769	85
6	·488 176	·879 285	·511 824	·120 715	1·892 791	846 144	6
7	·367 461	·872 079	·632 539	·127 921	·738 935	834 631	7
8	·239 540	·865 920	·760 460	·134 080	·573 566	819 329	8
9	·105 460	·856 461	·894 540	·143 539	·392 895	798 856	9
90	0·961 921	·843 020	$\bar{1}$·038 079	·156 980	·191 751	770 571	90
1	·804 941	·820 214	·195 059	·179 786	0·962 322	732 328	1
2	·625 155	·793 767	·374 845	·206 233	·694 650	672 103	2
3	·418 922	·736 107	·581 078	·263 893	·366 753	586 416	3
4	·155 029	·666 827	·844 971	·333 173	$\bar{1}$·953 169	416 517	4
95	$\bar{1}$·821 856	·547 830	0·178 144	·452 170	·369 686		95
6	·369 686		·630 314				6

HM(5).

3 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·830 992	035 883	2·884 804	984 699	$\bar{3}$·115 196	015 301	55
6	·866 875	036 995	·869 503	984 045	·130 497	015 955	6
7	·903 870	038 183	·853 548	983 246	·146 452	016 754	7
8	·942 053	039 458	·836 794	982 517	·163 206	017 483	8
9	·981 511	040 827	·819 311	981 625	·180 689	018 375	9
60	$\bar{4}$·022 338	042 279	·800 936	980 438	·199 064	019 562	60
1	·064 617	043 833	·781 374	979 283	·218 626	020 717	1
2	·108 450	045 485	·760 657	977 910	·239 343	022 090	2
3	·153 935	047 243	·738 567	976 412	·261 433	023 588	3
4	·201 178	049 108	·714 979	974 767	·285 021	025 233	4
65	·250 286	051 119	·689 746	973 344	·310 254	026 656	65
6	·301 405	053 290	·663 090	971 760	·336 910	028 240	6
7	·354 695	055 660	·634 850	970 273	·365 150	029 727	7
8	·410 355	058 253	·605 123	968 598	·394 877	031 402	8
9	·468 608	061 112	·573 721	966 858	·426 279	033 142	9
70	·529 720	064 231	·540 579	964 541	·459 421	035 459	70
1	·593 951	067 597	·505 120	961 680	·494 880	038 320	1
2	·661 548	071 173	·466 800	958 121	·533 200	041 879	2
3	·732 721	074 923	·424 921	954 053	·575 079	045 947	3
4	·807 644	078 805	·378 974	949 531	·621 026	050 469	4
75	·886 449	082 993	·328 505	945 882	·671 495	054 118	75
6	·969 442	087 425	·274 387	941 455	·725 613	058 545	6
7	$\bar{3}$·056 867	092 319	·215 842	937 801	·784 158	062 199	7
8	·149 186	097 614	·153 643	933 130	·846 357	066 870	8
9	·246 800	103 296	·086 773	927 810	·913 227	072 190	9
80	·350 096	109 408	·014 583	922 153	·985 417	077 847	80
1	·459 504	115 773	1·936 736	915 252	$\bar{2}$·063 264	084 748	1
2	·575 277	122 333	·851 988	907 914	·148 012	092 086	2
3	·697 610	129 128	·759 902	900 564	·240 098	099 436	3
4	·826 738	136 240	·660 466	893 258	·339 534	106 742	4
85	·962 978	144 231	·553 724	887 210	·446 276	112 790	85
6	$\bar{2}$·107 209	153 856	·440 934	881 909	·559 066	118 091	6
7	·261 065	165 369	·322 843	874 794	·677 157	125 206	7
8	·426 434	180 671	·197 637	868 967	·802 363	131 033	8
9	·607 105	201 144	·066 604	859 779	·933 396	140 221	9
90	·808 249	229 429	0·926 383	846 586	$\bar{1}$·073 617	153 414	90
1	$\bar{1}$·037 678	267 672	·772 969	823 784	·227 031	176 210	1
2	·305 350	327 897	·596 753	797 621	·403 247	202 379	2
3	·633 247	413 584	·394 374	739 554	·605 626	260 446	3
4	0·046 831	583 483	·133 928	670 467	·866 072	329 533	4
95	·630 314		$\bar{1}$·804 395	552 454	0·195 605	447 546	95
6			·356 849		·643 151		6

$H^{M(5)}$.

3 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	23·5619	·284607	·011587	55	11·9711	·622200	·047968
1	23·3662	·290306	·011914	6	11·6100	·632719	·050176
2	23·1496	·296614	·012282	7	11·2462	·643314	·052532
3	22·9163	·303407	·012686	8	10·8815	·653936	·055038
4	22·6732	·310489	·013116	9	10·5140	·664643	·057725
15	22·4247	·317730	·013564	60	10·1454	·675375	·060596
6	22·1728	·325066	·014028	1	9·7801	·686016	·063637
7	21·9245	·332298	·014495	2	9·4164	·696610	·066877
8	21·6821	·339358	·014962	3	9·0567	·707087	·070310
9	21·4549	·345975	·015408	4	8·7019	·717420	·073946
20	21·2481	·351999	·015822	65	8·3531	·727579	·077790
1	21·0692	·357206	·016186	6	8·0055	·737704	·081917
2	20·9129	·361759	·016509	7	7·6599	·747770	·086349
3	20·7641	·366095	·016821	8	7·3133	·757865	·091163
4	20·6185	·370334	·017130	9	6·9665	·767966	·096400
25	20·4694	·374676	·017452	70	6·6182	·778110	·102138
6	20·3074	·379396	·017806	1	6·2738	·788142	·108353
7	20·1292	·384585	·018202	2	5·9377	·797932	·115014
8	19·9414	·390058	·018626	3	5·6156	·807312	·122031
9	19·7409	·395896	·019088	4	5·3109	·816186	·129329
30	19·5273	·402119	·019590	75	5·0261	·824484	·136820
1	19·2999	·408742	·020135	6	4·7488	·832559	·144823
2	19·0629	·415645	·020717	7	4·4844	·840259	·153209
3	18·8182	·422770	·021332	8	4·2220	·847904	·162372
4	18·5633	·430197	·021990	9	3·9678	·855307	·172171
35	18·3022	·437800	·022681	80	3·7242	·862402	·182551
6	18·0417	·445387	·023390	1	3·4905	·869210	·193567
7	17·7773	·453091	·024130	2	3·2735	·875530	·204877
8	17·5087	·460913	·024903	3	3·0735	·881354	·216361
9	17·2356	·468864	·025711	4	2·8880	·886756	·228074
40	16·9536	·477078	·026573	85	2·7138	·891832	·240139
1	16·6621	·485569	·027492	6	2·5387	·896928	·253462
2	16·3584	·494416	·028483	7	2·3522	·902364	·269186
3	16·0465	·503500	·029537	8	2·1579	·908024	·287543
4	15·7260	·512836	·030661	9	1·9384	·914416	·311199
45	15·3987	·522369	·031854	90	1·6976	·921430	·341577
6	15·0686	·531983	·033107	1	1·4368	·929026	·381257
7	14·7356	·541680	·034424	2	1·1735	·936694	·430954
8	14·3995	·551471	·035811	3	·8868	·945044	·500869
9	14·0622	·561296	·037265	4	·6283	·952575	·585026
50	13·7235	·571159	·038792	95	·3531	·960592	·709947
1	13·3814	·581124	·040408	6	·0000	·970874	·970874
2	13·0356	·591199	·042121				
3	12·6837	·601446	·043954				
4	12·3296	·611760	·045895				

$H^{M}(5)$.

THREE AND A HALF PER-CENT.

HM(5).

$3\frac{1}{2}$ PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	7 089·19	152 122·0	2 851 473·6	1 705·23	57 400·61	10
1	6 822·06	145 300·0	2 699 351·6	1 677·84	55 695·38	1
2	6 568·86	138 731·1	2 554 051·6	1 655·34	54 017·54	2
3	6 327·54	132 403·6	2 415 320·5	1 636·15	52 362·21	3
4	6 095·65	126 307·9	2 282 917·0	1 618·24	50 726·06	4
15	5 871·61	120 436·3	2 156 609·1	1 600·33	49 107·82	15
6	5 654·60	114 781·7	2 036 172·8	1 581·88	47 507·49	6
7	5 442·77	109 338·9	1 921 391·1	1 561·26	45 925·61	7
8	5 235·56	104 103·4	1 812 052·1	1 538·11	44 364·35	8
9	5 030·95	99 072·42	1 707 948·8	1 510·54	42 826·24	9
20	4 828·15	94 244·27	1 608 876·4	1 477·88	41 315·70	20
1	4 626·03	89 618·24	1 514 632·1	1 439·03	39 837·82	1
2	4 426·44	85 191·80	1 425 013·9	1 395·87	38 398·79	2
3	4 232·78	80 959·02	1 339 822·1	1 351·90	37 002·93	3
4	4 045·85	76 913·17	1 258 863·0	1 308·10	35 651·03	4
25	3 866·72	73 046·45	1 181 949·9	1 265·79	34 342·92	25
6	3 696·71	69 349·74	1 108 903·4	1 226·54	33 077·13	6
7	3 535·76	65 813·99	1 039 553·7	1 190·59	31 850·59	7
8	3 382·22	62 431·77	973 739·7	1 156·63	30 660·00	8
9	3 236·13	59 195·63	911 307·9	1 124·91	29 503·37	9
30	3 097·13	56 098·51	852 112·3	1 095·34	28 378·46	30
1	2 964·86	53 133·65	796 013·8	1 067·81	27 283·11	1
2	2 838·32	50 295·33	742 880·1	1 041·53	26 215·31	2
3	2 716·95	47 578·38	692 584·8	1 016·14	25 173·78	3
4	2 600·86	44 977·52	645 006·4	991·927	24 157·63	4
35	2 489·21	42 488·31	600 028·9	968·229	23 165·71	35
6	2 380·98	40 107·33	557 540·6	944·173	22 197·48	6
7	2 276·66	37 830·68	517 433·3	920·370	21 253·31	7
8	2 176·13	35 654·55	479 602·6	896·831	20 332·93	8
9	2 079·28	33 575·27	443 948·0	873·566	19 436·10	9
40	1 986·48	31 588·79	410 372·8	851·087	18 562·54	40
1	1 897·59	29 691·20	378 784·0	829·368	17 711·45	1
2	1 812·67	27 878·53	349 092·8	808·619	16 882·08	2
3	1 731·10	26 147·44	321 214·2	788·345	16 073·46	3
4	1 652·75	24 494·69	295 066·8	768·535	15 285·12	4
45	1 577·29	22 917·39	270 572·1	748·971	14 516·58	45
6	1 504·23	21 413·16	247 654·7	729·246	13 767·61	6
7	1 433·51	19 979·65	226 241·5	709·394	13 038·37	7
8	1 365·09	18 614·57	206 261·9	689·446	12 328·97	8
9	1 298·72	17 315·84	187 647·3	669·246	11 639·53	9
50	1 234·39	16 081·45	170 331·5	648·834	10 970·28	50
1	1 172·24	14 909·21	154 250·0	628·420	10 321·45	1
2	1 112·20	13 797·01	139 340·8	608·028	9 693·026	2
3	1 054·41	12 742·60	125 543·8	587·841	9 084·998	3
4	998·466	11 744·13	112 801·2	567·557	8 497·157	4

$H^{M(5)}$.

$3\frac{1}{2}$ PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	944·500	10 799·634	101 057·09	547·355	7 929·600	55
6	892·313	9 907·321	90 257·45	527·108	7 382·245	6
7	841·873	9 065·448	80 350·13	506·843	6 855·137	7
8	793·007	8 272·441	71 284·68	486·446	6 348·294	8
9	745·827	7 526·614	63 012·24	466·083	5 861·848	9
60	700·170	6 826·444	55 485·63	445·646	5 395·765	60
1	655·766	6 170·678	48 659·19	424·920	4 950·118	1
2	612·735	5 557·943	42 488·51	404·065	4 525·198	2
3	570·949	4 986·994	36 930·57	382·999	4 121·133	3
4	530·403	4 456·590	31 943·57	361·761	3 738·134	4
65	491·092	3 965·499	27 486·98	340·386	3 376·373	65
6	453·316	3 512·182	23 521·48	319·217	3 035·987	6
7	417·035	3 095·147	20 009·30	298·266	2 716·770	7
8	382·400	2 712·746	16 914·15	277·734	2 418·504	8
9	349·352	2 363·395	14 201·41	257·616	2 140·770	9
70	317·921	2 045·474	11 838·01	237·999	1 883·154	70
1	287·869	1 757·605	9 792·539	218·698	1 645·154	1
2	259·065	1 498·540	8 034·934	199·629	1 426·456	2
3	231·394	1 267·146	6 536·395	180·719	1 226·827	3
4	204·905	1 062·240	5 269·249	162·055	1 046·108	4
75	179·717	882·523 8	4 207·008	143·796	884·053 3	75
6	156·363	726·160 5	3 324·485	126·519	740·257 8	6
7	134·737	591·423 2	2 598·324	110·181	613·738 3	7
8	115·147	476·276 2	2 006·901	95·147 2	503·557 1	8
9	97·387 8	378·888 4	1 530·625	81·281 8	408·409 9	9
80	81·399 7	297·488 7	1 151·736	68·587 0	327·128 1	80
1	67·182 8	230·305 9	854·248	57·122 8	258·541 1	1
2	54·608 6	175·697 4	623·942	46·820 4	201·418 3	2
3	43·671 0	132·026 4	448·244	37·729 5	154·597 9	3
4	34·355 7	97·670 7	316·218	29·891 1	116·868 4	4
85	26·587 4	71·083 3	218·547	23·284 5	86·977 3	85
6	20·291 2	50·792 2	147·464	17·887 4	63·692 8	6
7	15·292 9	35·499 3	96·672	13·575 3	45·805 5	7
8	11·336 1	24·163 1	61·173	10·135 7	32·230 2	8
9	8·284 8	15·878 3	37·009	7·467 7	22·094 5	9
90	5·924 3	9·954 0	21·131	5·387 4	14·626 8	90
1	4·107 3	5·846 7	11·177	3·770 7	9·239 4	1
2	2·701 9	3·144 8	5·330	2·504 2	5·468 7	2
3	1·672 4	1·472 4	2·186	1·566 0	2·964 6	3
4	·906 4	·566 0	·713	·856 6	1·398 5	4
95	·418 9	·147 2	·147	·399 7	·541 9	95
6	·147 2	·000 0	·000	·142 2	·142 2	6

$H^{M(5)}$.

$3\frac{1}{2}$ PER CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	3·850 597	1·983 319	4·149 403	0·016 681	5·182 192	980 074	10
1	·833 916	·983 574	·166 084	·016 426	·162 266	979 908	1
2	·817 490	·983 745	·182 510	·016 255	·142 174	979 726	2
3	·801 235	·983 785	·198 765	·016 215	·121 900	979 531	3
4	·785 020	·983 738	·214 980	·016 262	·101 431	979 326	4
15	·768 758	·983 644	·231 242	·016 356	·080 757	979 116	15
6	·752 402	·983 418	·247 598	·016 582	·059 873	978 902	6
7	·735 820	·983 143	·264 180	·016 857	·038 775	978 690	7
8	·718 963	·982 687	·281 037	·017 313	·017 465	978 488	8
9	·701 650	·982 131	·298 350	·017 869	4·995 953	978 302	9
20	·683 781	·981 428	·316 219	·018 572	·974 255	978 141	20
1	·665 209	·980 845	·334 791	·019 155	·952 396	978 002	1
2	·646 054	·980 572	·353 946	·019 428	·930 398	977 867	2
3	·626 626	·980 384	·373 374	·019 616	·908 265	977 736	3
4	·607 010	·980 333	·392 990	·019 667	·886 001	977 598	4
25	·587 343	·980 472	·412 657	·019 528	·863 599	977 446	25
6	·567 815	·980 667	·432 185	·019 333	·841 045	977 273	6
7	·548 482	·980 720	·451 518	·019 280	·818 318	977 088	7
8	·529 202	·980 825	·470 798	·019 175	·795 406	976 884	8
9	·510 027	·980 932	·489 973	·019 068	·772 290	976 661	9
30	·490 959	·981 045	·509 041	·018 955	·748 951	976 419	30
1	·472 004	·981 057	·527 996	·018 943	·725 370	976 158	1
2	·453 061	·981 021	·546 939	·018 979	·701 528	975 882	2
3	·434 082	·981 035	·565 918	·018 965	·677 410	975 586	3
4	·415 117	·980 944	·584 883	·019 056	·652 996	975 274	4
35	·396 061	·980 694	·603 939	·019 306	·628 270	974 954	35
6	·376 755	·980 543	·623 245	·019 457	·603 224	974 620	6
7	·357 298	·980 387	·642 702	·019 613	·577 844	974 271	7
8	·337 685	·980 227	·662 315	·019 773	·552 115	973 905	8
9	·317 912	·980 173	·682 088	·019 827	·526 020	973 513	9
40	·298 085	·980 117	·701 915	·019 883	·499 533	973 095	40
1	·278 202	·980 117	·721 798	·019 883	·472 628	972 642	1
2	·258 319	·980 002	·741 681	·019 998	·445 270	972 159	2
3	·238 321	·979 886	·761 679	·020 114	·417 429	971 643	3
4	·218 207	·979 706	·781 793	·020 294	·389 072	971 093	4
45	·197 913	·979 401	·802 087	·020 599	·360 165	970 516	45
6	·177 314	·979 087	·822 686	·020 913	·330 681	969 907	6
7	·156 401	·978 759	·843 599	·021 241	·300 588	969 265	7
8	·135 160	·978 357	·864 840	·021 643	·269 853	968 591	8
9	·113 517	·977 937	·886 483	·022 063	·238 444	967 881	9
50	·091 454	·977 562	·908 546	·022 438	·206 325	967 130	50
1	·069 016	·977 169	·930 984	·022 831	·173 455	966 330	1
2	·046 185	·976 823	·953 815	·023 177	·139 785	965 473	2
3	·023 008	·976 325	·976 992	·023 675	·105 258	964 563	3
4	2·999 333	·975 869	$\bar{3}$·000 667	·024 131	·069 821	963 588	4

H

HM(5).

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{6}$·817 808	019 926	3·231 784	992 966	$\bar{4}$·768 216	007 034	10
1	·837 734	020 092	·224 750	994 136	·775 250	005 864	1
2	·857 826	020 274	·218 886	994 938	·781 114	005 062	2
3	·878 100	020 469	·213 824	995 218	·786 176	004 782	3
4	·898 569	020 674	·209 042	995 168	·790 958	004 832	4
15	·919 243	020 884	·204 210	994 963	·795 790	005 037	15
6	·940 127	021 098	·199 173	994 302	·800 827	005 698	6
7	·961 225	021 310	·193 475	993 513	·806 525	006 487	7
8	·982 535	021 512	·186 988	992 145	·813 012	007 855	8
9	$\bar{5}$·004 047	021 698	·179 133	990 505	·820 867	009 495	9
20	·025 745	021 859	·169 638	988 432	·830 362	011 568	20
1	·047 604	021 998	·158 070	986 774	·841 930	013 226	1
2	·069 602	022 133	·144 844	986 100	·855 156	013 900	2
3	·091 735	022 264	·130 944	985 698	·869 056	014 302	3
4	·113 999	022 402	·116 642	985 719	·883 358	014 281	4
25	·136 401	022 554	·102 361	986 321	·897 639	013 679	25
6	·158 955	022 727	·088 682	987 082	·911 318	012 918	6
7	·181 682	022 912	·075 764	987 429	·924 236	012 571	7
8	·204 594	023 116	·063 193	987 926	·936 807	012 074	8
9	·227 710	023 339	·051 119	988 431	·948 881	011 569	9
30	·251 049	023 581	·039 550	988 942	·960 450	011 058	30
1	·274 630	023 842	·028 492	989 180	·971 508	010 820	1
2	·298 472	024 118	·017 672	989 284	·982 328	010 716	2
3	·322 590	024 414	·006 956	989 524	·993 044	010 476	3
4	·347 004	024 726	2·996 480	989 498	$\bar{3}$·003 520	010 502	4
35	·371 730	025 046	·985 978	989 074	·014 022	010 926	35
6	·396 776	025 380	·975 052	988 911	·024 948	011 089	6
7	·422 156	025 729	·963 963	988 748	·036 037	011 252	7
8	·447 885	026 095	·952 711	988 585	·047 289	011 415	8
9	·473 980	026 487	·941 296	988 678	·058 704	011 322	9
40	·500 467	026 905	·929 974	988 773	·070 026	011 227	40
1	·527 372	027 358	·918 747	988 997	·081 253	011 003	1
2	·554 730	027 841	·907 744	988 972	·092 256	011 028	2
3	·582 571	028 357	·896 716	988 948	·103 284	011 052	3
4	·610 928	028 907	·885 664	988 801	·114 336	011 199	4
45	·639 835	029 484	·874 465	988 409	·125 535	011 591	45
6	·669 319	030 093	·862 874	988 014	·137 126	011 986	6
7	·699 412	030 735	·850 888	987 612	·149 112	012 388	7
8	·730 147	031 409	·838 500	987 086	·161 500	012 914	8
9	·761 556	032 119	·825 586	986 548	·174 414	013 452	9
50	·793 675	032 870	·812 134	986 116	·187 866	013 884	50
1	·826 545	033 670	·798 250	985 674	·201 750	014 326	1
2	·860 215	034 527	·783 924	985 336	·216 076	014 664	2
3	·894 742	035 437	·769 260	984 749	·230 740	015 251	3
4	·930 179	036 412	·754 009	984 260	·245 991	015 740	4

HM(5).

$3\frac{1}{2}$ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	2·975 202	1·975 315	3·024 798	0·024 685	4·033 409	962 547	55
6	·950 517	·974 730	·049 483	·025 270	3·995 956	961 433	6
7	·925 247	·974 030	·074 753	·025 970	·957 389	960 245	7
8	·899 277	·973 361	·100 723	·026 639	·917 634	958 966	8
9	·872 638	·972 565	·127 362	·027 435	·876 600	957 595	9
60	·845 203	·971 546	·154 797	·028 454	·834 195	956 138	60
1	·816 749	·970 524	·183 251	·029 476	·790 333	954 581	1
2	·787 273	·969 324	·212 727	·030 676	·744 914	952 925	2
3	·756 597	·968 009	·243 403	·031 991	·697 839	951 164	3
4	·724 606	·966 557	·275 394	·033 443	·649 003	949 295	4
65	·691 163	·965 238	·308 837	·034 762	·598 298	947 279	65
6	·656 401	·963 772	·343 599	·036 228	·545 577	945 104	6
7	·620 173	·962 345	·379 827	·037 655	·490 681	942 728	7
8	·582 518	·960 745	·417 482	·039 255	·433 409	940 127	8
9	·543 263	·959 056	·456 737	·040 944	·373 536	937 258	9
70	·502 319	·956 875	·497 681	·043 125	·310 794	934 127	70
1	·459 194	·954 215	·540 806	·045 785	·244 921	930 747	1
2	·413 409	·950 943	·586 591	·049 057	·175 668	927 159	2
3	·364 352	·947 202	·635 648	·052 798	·102 827	923 396	3
4	·311 554	·943 035	·688 446	·056 965	·026 223	919 504	4
75	·254 589	·939 546	·745 411	·060 454	2·945 727	915 306	75
6	·194 135	·935 353	·805 865	·064 647	·861 033	910 865	6
7	·129 488	·931 765	·870 512	·068 235	·771 898	905 961	7
8	·061 253	·927 251	·938 747	·072 749	·677 859	900 652	8
9	1·988 504	·922 119	$\bar{2}$·011 496	·077 881	·578 511	894 960	9
80	·910 623	·916 635	·089 377	·083 365	·473 471	888 834	80
1	·827 258	·910 003	·172 742	·089 997	·362 305	882 460	1
2	·737 261	·902 932	·262 739	·097 068	·244 765	875 896	2
3	·640 193	·895 806	·359 807	·104 194	·120 661	869 103	3
4	·535 999	·888 677	·464 001	·111 323	1·989 764	862 004	4
85	·424 676	·882 631	·575 324	·117 369	·851 768	854 029	85
6	·307 307	·877 182	·692 693	·122 818	·705 797	844 423	6
7	·184 489	·869 976	·815 511	·130 024	·550 220	832 933	7
8	·054 465	·863 817	·945 535	·136 183	·383 153	817 652	8
9	0·918 282	·854 358	1·081 718	·145 642	·200 805	797 192	9
90	·772 640	·840 916	·227 360	·159 084	0·997 997	768 914	90
1	·613 556	·818 112	·386 444	·181 888	·766 911	730 683	1
2	·431 668	·791 663	·568 332	·208 337	·497 594	670 444	2
3	·223 331	·734 004	·776 669	·265 996	·168 038	584 786	3
4	1·957 335	·664 725	0·042 665	·335 275	1·752 824	414 962	4
95	·622 060	·545 726	·377 940	·454 274	·167 786		95
6	·167 786		·832 214				6

HM(5).

3½ PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{5}$·966 591	037 453	2·738 269	983 631	$\bar{3}$·261 731	016 369	55
6	$\bar{4}$·004 044	038 567	·721 900	982 973	·278 100	017 027	6
7	·042 611	039 755	·704 873	982 162	·295 127	017 838	7
8	·082 366	041 034	·687 035	981 428	·312 965	018 572	8
9	·123 400	042 405	·668 463	980 528	·331 537	019 472	9
60	·165 805	043 862	·648 991	979 316	·351 009	020 684	60
1	·209 667	045 419	·628 307	978 144	·371 693	021 856	1
2	·255 086	047 075	·606 451	976 747	·393 549	023 253	2
3	·302 161	048 836	·583 198	975 224	·416 802	024 776	3
4	·350 997	050 705	·558 422	973 550	·441 578	026 450	4
65	·401 702	052 721	·531 972	972 115	·468 028	027 885	65
6	·454 423	054 896	·504 087	970 517	·495 913	029 483	6
7	·509 319	057 272	·474 604	969 025	·525 396	030 975	7
8	·566 591	059 873	·443 629	967 345	·556 371	032 655	8
9	·626 464	062 742	·410 974	965 602	·589 026	034 398	9
70	·689 206	065 873	·376 576	963 269	·623 424	036 731	70
1	·755 079	069 253	·339 845	960 379	·660 155	039 621	1
2	·824 332	072 841	·300 224	956 779	·699 776	043 221	2
3	·897 173	076 604	·257 003	952 660	·742 997	047 340	3
4	·973 777	080 496	·209 663	948 082	·790 337	051 918	4
75	$\bar{3}$·054 273	084 694	·157 745	944 412	·842 255	055 588	75
6	·138 967	089 135	·102 157	939 951	·897 843	060 049	6
7	·228 102	094 039	·042 108	936 288	·957 892	063 712	7
8	·322 141	099 348	$\bar{1}$·978 396	931 597	$\bar{2}$·021 604	068 403	8
9	·421 489	105 040	·909 993	926 249	·090 007	073 751	9
80	·526 529	111 166	·836 242	920 568	·163 758	079 432	80
1	·637 695	117 540	·756 810	913 625	·243 190	086 375	1
2	·755 235	124 104	·670 435	906 246	·329 565	093 754	2
3	·879 339	130 897	·576 681	898 860	·423 319	101 140	3
4	$\bar{2}$·010 236	137 996	·475 541	891 526	·524 459	108 474	4
85	·148 232	145 971	·367 067	885 480	·632 933	114 520	85
6	·294 203	155 577	·252 547	880 202	·747 453	119 798	6
7	·449 780	167 067	·132 749	873 104	·867 251	126 896	7
8	·616 847	182 348	·005 853	867 333	·994 147	132 667	8
9	·799 195	202 808	0·873 186	858 192	$\bar{1}$·126 814	141 808	9
90	$\bar{1}$·002 003	231 086	·731 378	845 043	·268 622	154 957	90
1	·233 089	269 317	·576 421	822 244	·423 579	177 756	1
2	·502 406	329 556	·398 665	796 132	·601 335	203 868	2
3	·831 962	415 214	·194 797	738 001	·805 203	261 999	3
4	0·247 176	585 038	$\bar{1}$·932 798	668 948	0·067 202	331 052	4
95	·832 214		·601 746	551 100	·398 254	448 900	95
6			·152 846		·847 154		6

$\mathrm{H}^{\mathrm{M}(5)}$.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	21·4583	·240 540	·010 711	55	11·4342	·579 519	·046 607
1	21·2986	·245 943	·011 030	6	11·1030	·590 722	·048 808
2	21·1195	·251 997	·011 393	7	10·7682	·602 041	·051 158
3	20·9250	·258 579	·011 794	8	10·4317	·613 420	·053 659
4	20·7210	·265 474	·012 222	9	10·0916	·624 922	·056 342
15	20·5116	·272 554	·012 670	60	9·7497	·636 484	·059 209
6	20·2988	·279 751	·013 135	1	9·4099	·647 974	·062 246
7	20·0889	·286 850	·013 602	2	9·0707	·659 444	·065 481
8	19·8839	·293 782	·014 067	3	8·7346	·670 812	·068 910
9	19·6926	·300 250	·014 510	4	8·4023	·682 050	·072 541
20	19·5197	·306 096	·014 917	65	8·0749	·693 122	·076 378
1	19·3726	·311 072	·015 269	6	7·7478	·704 184	·080 499
2	19·2462	·315 348	·015 576	7	7·4218	·715 205	·084 923
3	19·1267	·319 388	·015 869	8	7·0940	·726 292	·089 732
4	19·0104	·323 319	·016 158	9	6·7651	·737 414	·094 965
25	18·8910	·327 354	·016 457	70	6·4339	·748 612	·100 702
6	18·7599	·331 793	·016 791	1	6·1056	·759 715	·106 918
7	18·6138	·336 730	·017 168	2	5·7844	·770 575	·113 580
8	18·4588	·341 972	·017 574	3	5·4762	·781 000	·120 597
9	18·2921	·347 610	·018 018	4	5·1841	·790 877	·127 890
30	18·1131	·353 664	·018 504	75	4·9106	·800 122	·135 370
1	17·9212	·360 154	·019 034	6	4·6441	·809 137	·143 361
2	17·7201	·366 953	·019 602	7	4·3895	·817 749	·151 731
3	17·5117	·374 002	·020 204	8	4·1362	·826 310	·160 879
4	17·2933	·381 384	·020 848	9	3·8905	·834 620	·170 661
35	17·0690	·388 971	·021 527	80	3.6547	·842 596	·181 022
6	16·8449	·396 549	·022 222	1	3·4280	·850 260	·192 017
7	16·6167	·404 264	·022 948	2	3·2174	·857 382	.203 297
8	16·3844	·412 122	·023 706	3	3·0232	·863 948	·214 742
9	16·1476	·420 130	·024 501	4	2·8429	·870 046	·226 402
40	15·9019	·428 439	·025 349	85	2·6736	·875 772	·238 399
1	15·6468	·437 064	·026 255	6	2·5032	·881 536	·251 639
2	15·3798	·446 093	·027 234	7	2·3213	·887 688	·267 271
3	15·1046	·455 402	·028 278	8	2·1315	·894 104	·285 518
4	14·8206	·465 004	·029 392	9	1·9166	·901 372	·309 053
45	14·5295	·474 846	·030 577	90	1·6802	·909 364	·339 292
6	14·2353	·484 797	·031 821	1	1·4235	·918 048	·378 813
7	13·9376	·494 866	·033 129	2	1·1639	·926 824	·428 306
8	13·6362	·505 057	·034 507	3	·8805	·936 410	·497 970
9	13·3330	·515 310	·035 953	4	·6244	·945 068	·581 782
50	13·0278	·525 630	·037 471	95	·3513	·954 303	·706 190
1	12·7186	·536 085	·039 077	6	·0000	·966 184	·966 184
2	12·4051	·546 688	·040 782				
3	12·0851	·557 509	·042 606				
4	11·7622	·568 429	·044 540				

$H^{M}(5)$.

FOUR PER-CENT.

$H^{M(5)}$.

4 PER-CENT.

Commutation Table.

x	D_x	N_x	S_x	M_x	R_x	x
10	6 755·64	132 786·0	2 348 401	1 388·66	43 851·53	10
1	6 469·83	126 316·1	2 215 615	1 362·67	42 462·87	1
2	6 199·75	120 116·4	2 089 298	1 341·44	41 100·20	2
3	5 943·28	114 173·1	1 969 182	1 323·42	39 758·76	3
4	5 697·95	108 475·2	1 855 009	1 306·67	38 435·34	4
15	5 462·14	103 013·0	1 746 534	1 290·02	37 128·67	15
6	5 234·97	97 778·06	1 643 521	1 272·93	35 838·65	6
7	5 014·63	92 763·43	1 545 743	1 253·94	34 565·72	7
8	4 800·53	87 962·90	1 452 979	1 232·71	33 311·79	8
9	4 590·74	83 372·16	1 365 016	1 207·55	32 079·08	9
20	4 384·51	78 987·65	1 281 644	1 177·89	30 871·53	20
1	4 180·77	74 806·88	1 202 657	1 142·78	29 693·64	1
2	3 981·15	70 825·73	1 127 850	1 103·96	28 550·86	2
3	3 788·67	67 037·06	1 057 024	1 064·61	27 446·89	3
4	3 603·94	63 433·11	989 986·9	1 025·59	26 382·29	4
25	3 427·82	60 005·29	926 553·8	988·082	25 356·69	25
6	3 261·35	56 743·94	866 548·5	953·456	24 368·61	6
7	3 104·36	53 639·59	809 804·5	921·896	23 415·16	7
8	2 955·28	50 684·31	756 164·9	892·216	22 493·26	8
9	2 814·04	47 870·27	705 480·6	864·640	21 601·04	9
30	2 680·21	45 190·06	657 610·4	839·050	20 736·40	30
1	2 553·41	42 636·65	612 420·3	815·333	19 897·35	1
2	2 432·68	40 203·96	569 783·7	792·813	19 082·02	2
3	2 317·47	37 886·50	529 579·7	771·160	18 289·21	3
4	2 207·78	35 678·72	491 693·2	750·603	17 518·05	4
35	2 102·84	33 575·88	456 014·5	730·583	16 767·44	35
6	2 001·74	31 574·14	422 438·6	710·359	16 036·86	6
7	1 904·83	29 669·31	390 864·4	690·443	15 326·50	7
8	1 811·97	27 857·34	361 195·1	670·844	14 636·06	8
9	1 723·00	26 134·34	333 337·8	651·564	13 965·22	9
40	1 638·19	24 496·14	307 203·5	633·027	13 313·65	40
1	1 557·36	22 938·78	282 707·3	615·202	12 680·62	1
2	1 480·52	21 458·27	259 768·5	598·255	12 065·42	2
3	1 407·09	20 051·17	238 310·3	581·775	11 467·17	3
4	1 336·95	18 714·22	218 259·1	565·751	10 885·39	4
45	1 269·78	17 444·44	199 544·9	550·001	10 319·64	45
6	1 205·14	16 239·31	182 100·4	534·198	9 769·640	6
7	1 142·96	15 096·35	165 861·1	518·370	9 235·442	7
8	1 083·17	14 013·18	150 764·8	502·541	8 717·073	8
9	1 025·56	12 987·62	136 751·6	486·590	8 214·531	9
50	970·073	12 017·55	123 764·0	470·549	7 727·941	50
1	916·797	11 100·75	111 746·4	454·584	7 257·392	1
2	865·664	10 235·09	100 645·7	438·712	6 802·809	2
3	816·732	9 418·353	90 410·61	423·075	6 364·097	3
4	769·683	8 648·671	80 992·26	407·438	5 941·022	4

$H^{M(5)}$.

4 PER-CENT.

Commutation Table—(continued).

x	D_x	N_x	S_x	M_x	R_x	x
55	724·582	7 924·089	72 343·59	391·941	5 533·583	55
6	681·256	7 242·833	64 419·50	376·483	5 141·643	6
7	639·656	6 603·178	57 176·67	361·085	4 765·160	7
8	599·631	6 003·547	50 573·49	345·662	4 404·075	8
9	561·244	5 442·303	44 569·94	330·339	4 058·413	9
60	524·353	4 917·950	39 127·64	315·034	3 728·074	60
1	488·738	4 429·211	34 209·69	299·587	3 413·040	1
2	454·472	3 974·739	29 780·48	284·118	3 113·454	2
3	421·443	3 553·296	25 805·74	268·569	2 829·336	3
4	389·632	3 163·663	22 252·44	252·967	2 560·767	4
65	359·020	2 804·644	19 088·78	237·340	2 307·800	65
6	329·810	2 474·833	16 284·13	221·939	2 070·460	6
7	301·955	2 172·878	13 809·30	206·769	1 848·520	7
8	275·547	1 897·332	11 636·42	191·974	1 641·751	8
9	250·523	1 646·809	9 739·092	177·548	1 449·777	9
70	226·887	1 419·922	8 092·283	163·548	1 272·228	70
1	204·452	1 215·470	6 672·361	149·840	1 108·680	1
2	183·111	1 032·359	5 456·892	136·362	958·840	2
3	162·766	869·592 8	4 424·533	123·060	822·478	3
4	143·441	726·152 1	3 554·940	109·995	699·418	4
75	125·203	600·949 2	2 828·788	97·273 9	589·424	75
6	108·410	492·539 6	2 227·839	85·296 1	492·150	6
7	92·966 8	399·572 8	1 735·299	74·023 0	406·853	7
8	79·067 8	320·505 0	1 335·726	63·699 6	332·831	8
9	66·551 6	253·953 5	1 015·221	54·224 4	269·131	9
80	55·358 4	198·595 1	761·268	45·591 0	214·906	80
1	45·470 1	153·125 0	562·673	37·831 8	169·316	1
2	36·782 0	116·342 9	409·548	30·892 6	131·484	2
3	29·273 5	87·069 4	293·205	24·798 8	100·591	3
4	22·918 6	64·150 9	206·135	19·569 8	75·792 3	4
85	17·651 1	46·499 8	141·984	15·183 7	56·222 6	85
6	13·406 3	33·093 4	95·485	11·617 9	41·038 8	6
7	10·055 4	23·038 0	62·391	8·782 6	29·420 9	7
8	7·417 92	15·620 1	39·353	6·531 8	20·638 4	8
9	5·395 18	10·224 9	23·733	4·794 4	14·106 5	9
90	3·839 47	6·385 5	13·508	3·446 2	9·312 1	90
1	2·649 07	3·736 4	7·123	2·403 5	5·865 9	1
2	1·734 25	2·002 1	3·386	1·590 5	3·462 4	2
3	1·068 28	·933 9	1·384	·991 3	1·871 9	3
4	·576 23	·357 6	·450	·540 3	·880 6	4
95	·264 99	·092 7	·093	·251 2	·340 3	95
6	·092 65	·000 0	·000	·089 1	·089 1	6

HM(5).

4 PER CENT

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences.*

x	Log D_x	Δ (Log vp_x)	Colog D_x	Δ (Colog vp_x)	Log N_x	Δ	x
10	3·829 667	$\bar{1}$·981 226	$\bar{4}$·170 333	0·018 774	5·123 152	978 307	10
1	·810 893	·981 481	·189 107	·018 519	·101 459	978 144	1
2	·792 374	·981 652	·207 626	·018 348	·079 603	977 961	2
3	·774 026	·981 692	·225 974	·018 308	·057 564	977 766	3
4	·755 718	·981 645	·244 282	·018 355	·035 330	977 562	4
15	·737 363	·981 551	·262 637	·018 449	·012 892	977 349	15
6	·718 914	·981 325	·281 086	·018 675	4·990 241	977 136	6
7	·700 239	·981 051	·299 761	·018 949	·967 377	976 923	7
8	·681 290	·980 593	·318 710	·019 407	·944 300	976 721	8
9	·661 883	·980 038	·338 117	·019 962	·921 021	976 538	9
20	·641 921	·979 335	·358 079	·020 665	·897 559	976 383	20
1	·621 256	·978 752	·378 744	·021 248	·873 942	976 249	1
2	·600 008	·978 479	·399 992	·021 521	·850 191	976 124	2
3	·578 487	·978 291	·421 513	·021 709	·826 315	976 001	3
4	·556 778	·978 240	·443 222	·021 760	·802 316	975 874	4
25	·535 018	·978 380	·464 982	·021 620	·778 190	975 729	25
6	·513 398	·978 573	·486 602	·021 427	·753 919	975 567	6
7	·491 971	·978 627	·508 029	·021 373	·729 486	975 388	7
8	·470 598	·978 732	·529 402	·021 268	·704 874	975 192	8
9	·449 330	·978 840	·550 670	·021 160	·680 066	974 977	9
30	·428 170	·978 951	·571 830	·021 049	·655 043	974 740	30
1	·407 121	·978 965	·592 879	·021 035	·629 783	974 486	1
2	·386 086	·978 927	·613 914	·021 073	·604 269	974 216	2
3	·365 013	·978 942	·634 987	·021 058	·578 485	973 924	3
4	·343 955	·978 852	·656 045	·021 148	·552 409	973 618	4
35	·322 807	·978 600	·677 193	·021 400	·526 027	973 305	35
6	·301 407	·978 450	·698 593	·021 550	·499 332	972 975	6
7	·279 857	·978 294	·720 143	·021 706	·472 307	972 633	7
8	.258 151	·978 134	·741 849	·021 866	·444 940	972 272	8
9	·236 285	·978 080	·763 715	.021 920	·417 212	971 886	9
40	·214 365	·978 024	·785 635	·021 976	·389 098	971 472	40
1	·192 389	·978 024	·807 611	·021 976	·360 570	971 025	1
2	·170 413	·977 910	·829 587	·022 090	·331 595	970 545	2
3	·148 323	·977 792	·851 677	·022 208	·302 140	970 032	3
4	·126 115	·977 613	·873 885	·022 387	·272 172	969 485	4
45	·103 728	·977 309	·896 272	·022 691	·241 657	968 910	45
6	·081 037	·976 993	·918 963	·023 007	·210 567	968 305	6
7	·058 030	·976 667	·941 970	·023 333	·178 872	967 665	7
8	·034 697	·976 264	·965 303	·023 736	·146 537	966 993	8
9	·010 961	·975 843	·989 039	·024 157	·113 530	966 286	9
50	2·986 804	·975 469	$\bar{3}$·013 196	·024 531	.079 816	965 536	50
1	·962 273	·975 076	·037 727	·024 924	·045 352	964 740	1
2	·937 349	·974 731	·062 651	·025 269	·010 092	963 883	2
3	·912 080	·974 232	·087 920	.025 768	3·973 975	962 974	3
4	·886 312	·973 775	·113 688	·026 225	·936 949	962 000	4

HM(5).

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, and M_x; with their Differences.

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
10	$\bar{6}$·876 848	021 693	3·142 595	991 797	$\bar{4}$·857 405	008 203	10
1	·898 541	021 856	·134 392	993 178	·865 608	006 822	1
2	·920 397	022 039	·127 570	994 128	·872 430	005 872	2
3	·942 436	022 234	·121 698	994 469	·878 302	005 531	3
4	·964 670	022 438	·116 167	994 428	·883 833	005 572	4
15	·987 108	022 651	·110 595	994 210	·889 405	005 790	15
6	$\bar{5}$·009 759	022 864	·104 805	993 470	·895 195	006 530	6
7	·032 623	023 077	·098 275	992 586	·901 725	007 414	7
8	·055 700	023 279	·090 861	991 045	·909 139	008 955	8
9	·078 979	023 462	·081 906	989 198	·918 094	010 802	9
20	·102 441	023 617	·071 104	986 859	·928 896	013 141	20
1	·126 058	023 751	·057 963	984 991	·942 037	015 009	1
2	·149 809	023 876	·042 954	984 235	·957 046	015 765	2
3	·173 685	023 999	·027 189	983 786	·972 811	016 214	3
4	·197 684	024 126	·010 975	983 818	·989 025	016 182	4
25	·221 810	024 271	2·994 793	984 508	$\bar{3}$·005 207	015 492	25
6	·246 081	024 433	·979 301	985 379	·020 699	014 621	6
7	·270 514	024 612	·964 680	985 790	·035 320	014 210	7
8	·295 126	024 808	·950 470	986 365	·049 530	013 635	8
9	·319 934	025 023	·936 835	986 953	·063 165	013 047	9
30	·344 957	025 260	·923 788	987 547	·076 212	012 453	30
1	·370 217	025 514	·911 335	987 836	·088 665	012 164	1
2	·395 731	025 784	·899 171	987 974	·100 829	012 026	2
3	·421 515	026 076	·887 145	988 265	·112 855	011 735	3
4	·447 591	026 382	·875 410	988 260	·124 590	011 740	4
35	·473 973	026 695	·863 670	987 808	·136 330	012 192	35
6	·500 668	027 025	·851 478	987 650	·148 522	012 350	6
7	·527 693	027 367	·839 128	987 493	·160 872	012 507	7
8	·555 060	027 728	·826 621	987 336	·173 379	012 664	8
9	·582 788	028 114	·813 957	987 465	·186 043	012 535	9
40	·610 902	028 528	·801 422	987 596	·198 578	012 404	40
1	·639 430	028 975	·789 018	987 869	·210 982	012 131	1
2	·668 405	029 455	·776 887	987 868	·223 113	012 132	2
3	·697 860	029 968	·764 755	987 870	·235 245	012 130	3
4	·727 828	030 515	·752 625	987 738	·247 375	012 262	4
45	·758 343	031 090	·740 363	987 339	·259 637	012 661	45
6	·789 433	031 695	·727 702	986 938	·272 298	013 062	6
7	·821 128	032 335	·714 640	986 532	·285 360	013 468	7
8	·853 463	033 007	·701 172	985 991	·298 828	014 009	8
9	·886 470	033 714	·687 163	985 442	·312 837	014 558	9
50	·920 184	034 464	·672 605	985 009	·327 395	014 991	50
1	·954 648	035 260	·657 614	984 565	·342 386	015 435	1
2	·989 908	036 117	·642 179	984 239	·357 821	015 761	2
3	$\bar{4}$·026 025	037 026	·626 418	983 644	·373 582	016 356	3
4	·063 051	038 000	·610 062	983 158	·389 938	016 842	4

$H^{M(5)}$.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Log D_x	Δ (Log rp_x)	Colog D_x	Δ (Colog rp_x)	Log N_x	Δ	x
55	2·860 087	$\bar{1}$·973 223	$\bar{3}$·139 913	0·026 777	3·898 949	960 960	55
6	·833 310	·972 636	·166 690	·027 364	·859 909	959 844	6
7	·805 946	·971 938	·194 054	·028 062	·819 753	958 655	7
8	·777 884	·971 268	·222 116	·028 732	·778 408	957 375	8
9	·749 152	·970 472	·250 848	·029 528	·735 783	956 001	9
60	·719 624	·969 453	·280 376	·030 547	·691 784	954 542	60
1	·689 077	·968 431	·310 923	·031 569	·646 326	952 983	1
2	·657 508	·967 231	·342 492	·032 769	·599 309	951 322	2
3	·624 739	·965 916	·375 261	·034 084	·550 631	949 559	3
4	·590 655	·964 463	·409 345	·035 537	·500 190	947 687	4
65	·555 118	·963 146	·444 882	·036 854	·447 877	945 669	65
6	·518 264	·961 679	·481 736	·038 321	·393 546	943 489	6
7	·479 943	·960 252	·520 057	·039 748	·337 035	941 108	7
8	·440 195	·958 652	·559 805	·041 348	·278 143	938 500	8
9	·398 847	·956 963	·601 153	·043 037	·216 643	935 622	9
70	·355 810	·954 782	·644 190	·045 218	·152 265	932 479	70
1	·310 592	·952 122	·689 408	·047 878	·084 744	929 087	1
2	·262 714	·948 849	·737 286	·051 151	·013 831	925 485	2
3	·211 563	·945 109	·788 437	·054 891	2·939 316	921 712	3
4	·156 672	·940 942	·843 328	·059 058	·861 028	917 810	4
75	·097 614	·937 453	·902 386	·062 547	·778 838	913 603	75
6	·035 067	·933 261	·964 933	·066 739	·692 441	909 155	6
7	1·968 328	·929 671	$\bar{2}$·031 672	·070 329	·601 596	904 239	7
8	·897 999	·925 159	·102 001	·074 841	·505 835	898 919	8
9	·823 158	·920 026	·176 842	·079 974	·404 754	893 214	9
80	·743 184	·914 542	·256 816	·085 458	·297 968	887 075	80
1	·657 726	·907 910	·342 274	·092 090	·185 043	880 697	1
2	·565 636	·900 839	·434 364	·099 161	·065 740	874 126	2
3	·466 475	·893 713	·533 525	·106 287	1·939 866	867 336	3
4	·360 188	·886 583	·639 812	·113 417	·807 202	860 249	4
85	·246 771	·880 539	·753 229	·119 461	·667 451	852 291	85
6	·127 310	·875 089	·872 690	·124 911	·519 742	842 704	6
7	·002 399	·867 883	·997 601	·132 117	·362 446	831 238	7
8	0·870 282	·861 724	$\bar{1}$·129 718	·138 276	·193 684	815 977	8
9	·732 006	·852 265	·267 994	·147 735	·009 661	795 532	9
90	·584 271	·838 823	·415 729	·161 177	0·805 193	767 260	90
1	·423 094	·816 019	·576 906	·183 981	·572 453	729 042	1
2	·239 113	·789 570	·760 887	·210 430	·301 495	668 790	2
3	·028 683	·731 911	·971 317	·268 089	·970 285	583 162	3
4	$\bar{1}$·760 594	·662 632	0·239 406	·337 368	$\bar{1}$·553 447	413 412	4
95	·423 226	·543 633	·576 774	·456 367	$\bar{2}$·966 859		95
6	$\bar{2}$·966 859		1·033 141				6

$H^{M(5)}$.

4 PER-CENT.

Logarithms and Co-logarithms of D_x, N_x, *and* M_x; *with their Differences*—(continued).

x	Colog N_x	Δ	Log M_x	Δ	Colog M_x	Δ	x
55	$\bar{4}$·101 051	039 040	2·593 220	982 525	$\bar{3}$·406 780	017 475	55
6	·140 091	040 156	·575 745	981 864	·424 255	018 136	6
7	·180 247	041 345	·557 609	981 043	·442 391	018 957	7
8	·221 592	042 625	·538 652	980 307	·461 348	019 693	8
9	·264 217	043 999	·518 959	979 398	·481 041	020 602	9
60	·308 216	045 458	·498 357	978 165	·501 643	021 835	60
1	·353 674	047 017	·476 522	976 977	·523 478	023 023	1
2	·400 691	048 678	·453 499	975 556	·546 501	024 444	2
3	·449 369	050 441	·429 055	974 009	·570 945	025 991	3
4	·499 810	052 313	·403 064	972 308	·596 936	027 692	4
65	·552 123	054 331	·375 372	970 862	·624 628	029 138	65
6	·606 454	056 511	·346 234	969 252	·653 766	030 748	6
7	·662 965	058 892	·315 486	967 757	·684 514	032 243	7
8	·721 857	061 500	·283 243	966 073	·716 757	033 927	8
9	·783 357	064 378	·249 316	964 330	·750 684	035 670	9
70	·847 735	067 521	·213 646	961 982	·786 354	038 018	70
1	·915 256	070 913	·175 628	959 065	·824 372	040 935	1
2	·986 169	074 515	·134 693	955 423	·865 307	044 577	2
3	$\bar{3}$·060 684	078 288	·090 116	951 256	·909 884	048 744	3
4	·138 972	082 190	·041 372	946 625	·958 628	053 375	4
75	·221 162	086 397	1·987 997	942 932	$\bar{2}$·012 003	057 068	75
6	·307 559	090 845	·930 929	938 438	·069 071	061 562	6
7	·398 404	095 761	·869 367	934 770	·130 633	065 230	7
8	·494 165	101 081	·804 137	930 058	·195 863	069 942	8
9	·595 246	106 786	·734 195	924 684	·265 805	075 316	9
80	·702 032	112 925	·658 879	918 979	·341 121	081 021	80
1	·814 957	119 303	·577 858	911 996	·422 142	088 004	1
2	·934 260	125 874	·489 854	904 575	·510 146	095 425	2
3	$\bar{2}$·060 134	132 664	·394 429	897 157	·605 571	102 843	3
4	·192 798	139 751	·291 586	889 793	·708 414	110 207	4
85	·332 549	147 709	·181 379	883 748	·818 621	116 252	85
6	·480 258	157 296	·065 127	878 495	·934 873	121 505	6
7	·637 554	168 762	0·943 622	871 414	$\bar{1}$·056 378	128 586	7
8	·806 316	184 023	·815 036	865 699	·184 964	134 301	8
9	·990 339	204 468	·680 735	856 605	·319 265	143 395	9
90	$\bar{1}$·194 807	232 740	·537 340	843 500	·462 660	156 500	90
1	·427 547	270 958	·380 840	820 706	·619 160	179 294	1
2	·698 505	331 210	·201 546	794 646	·798 454	205 354	2
3	·029 715	416 838	$\bar{1}$·996 192	736 451	0·003 808	263 549	3
4	0·446 553	586 588	·732 643	667 432	·267 357	332 568	4
95	1·033 141		·400 075	549 751	·599 925	450 249	95
6			$\bar{2}$·949 826		1·050 174		6

H^M(5).

4 PER-CENT.

Values of Annuities, and Single and Annual Premiums for Assurance of a Unit.

x	a_x	A_x	ϖ_x	x	a_x	A_x	ϖ_x
10	19·655 5	·205 555	·009 952	55	10·936 1	·540 920	·045 318
1	19·523 9	·210 620	·010 262	6	10·631 6	·552 631	·047 511
2	19·374 4	·216 370	·010 620	7	10·323 0	·564 499	·049 854
3	19·210 5	·222 675	·011 018	8	10·012 1	·576 459	·052 348
4	19·037 6	·229 324	·011 445	9	9·696 9	·588 581	·055 024
15	18·859 4	·236 174	·011 892	60	9·379 1	·600 804	·057 886
6	18·677 9	·243 160	·012 357	1	9·062 5	·612 979	·060 917
7	18·498 6	·250 055	·012 824	2	8·745 8	·625 160	·064 147
8	18·323 6	·256 786	·013 289	3	8·431 3	·637 259	·067 569
9	18·160 9	·263 040	·013 728	4	8·119 6	·649 246	·071 192
20	18·015 2	·268 647	·014 128	65	7·811 9	·661 080	·075 021
1	17·893 1	·273 342	·014 468	6	7·503 8	·672 930	·079 133
2	17·790 3	·277 297	·014 757	7	7·196 0	·684 767	·083 549
3	17·694 1	·280 997	·015 031	8	6·885 7	·696 702	·088 350
4	17·601 0	·284 575	·015 299	9	6·573 5	·708 710	·093 578
25	17·505 4	·288 254	·015 577	70	6·258 3	·720 835	·099 312
6	17·398 9	·292 350	·015 890	1	5·945 0	·732 885	·105 527
7	17·278 9	·296 967	·016 247	2	5·637 9	·744 696	·112 189
8	17·150 5	·301 906	·016 634	3	5·342 6	·756 054	·119 202
9	17·011 2	·307 259	·017 059	4	5·062 4	·766 832	·126 490
30	16·860 6	·313 053	·017 528	75	4·799 8	·776 932	·133 958
1	16·698 0	·319 311	·018 042	6	4·543 3	·786 796	·141 935
2	16·526 6	·325 901	·018 595	7	4·298 0	·796 230	·150 289
3	16·348 3	·332 761	·019 181	8	4·053 6	·805 634	·159 419
4	16·160 5	·339 981	·019 812	9	3·815 9	·814 774	·169 184
35	15·966 9	·347 427	·020 477	80	3·587 4	·823 560	·179 525
6	15·773 4	·354 871	·021 157	1	3·367 6	·832 016	·190 498
7	15·575 8	·362 469	·021 867	2	3·163 0	·839 882	·201 749
8	15·374 1	·370 228	·022 611	3	2·974 3	·847 138	·213 152
9	15·168 0	·378 157	·023 389	4	2·799 1	·853 882	·224 761
40	14·953 2	·386 417	·024 222	85	2·634 4	·860 217	·236 688
1	14·729 3	·395 029	·025 114	6	2·468 5	·866 596	·249 848
2	14·493 8	·404 086	·026 081	7	2·291 1	·873 420	·265 387
3	14·250 1	·413 458	·027 112	8	2·105 7	·880 550	·283 524
4	13·997 7	·423 165	·028 215	9	1·895 2	·888 646	·306 938
45	13·738 2	·433 147	·029 389	90	1·663 1	·897 572	·337 038
6	13·475 0	·443 267	·030 623	1	1·410 5	·907 290	·376 398
7	13·208 1	·453 534	·031 921	2	1·154 5	·917 134	·425 690
8	12·937 2	·463 954	·033 289	3	·874 2	·927 916	·495 104
9	12·663 9	·474 462	·034 724	4	·620 7	·937 668	·578 573
50	12·388 3	·485 067	·036 231	95	·349 7	·948 088	·702 470
1	12·108 2	·495 839	·037 827	6	·000 0	·961 538	·961 538
2	11·823 4	·506 792	·039 521				
3	11·531 7	·518 010	·041 336				
4	11·236 7	·529 359	·043 260				

TWO LIVES.

Hᴹ.

THREE PER-CENT.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives. Equal Ages.

x	$a_{x.x}$	$2a_x - a_{x.x}$	x	$a_{x.x}$	$2a_x - a_{x.x}$
10	21·0079	27·2889	55	8·8676	15·3200
1	·8518	·1388	6	·5303	14·9181
2	·6497	26·9787	7	·1945	·5121
3	·4111	·8095	8	7·8604	·1022
4	·1465	·6329	9	·5276	13·6890
15	19·8661	·4501	60	·1988	·2730
6	·5801	·2629	1	6·8753	12·8557
7	·2991	·0731	2	·5581	·4375
8	·0334	25·8820	3	·2482	·0192
9	18·7936	·6922	4	5·9468	11·6014
20	·5817	·5033	65	·6519	·1839
1	·3838	·3130	6	·3621	10·7661
2	·1926	·1198	7	·0757	·3479
3	17·9975	24·9217	8	4·7914	9·9290
4	·7908	·7170	9	·5057	·5089
25	·5703	·5055	70	·2226	·0904
6	·3398	·2874	1	3·9453	8·6765
7	·1011	·0635	2	·6788	·2708
8	16·8600	23·8314	3	·4279	7·8773
9	·6176	·6004	4	·1975	·4989
30	·3734	·3614	75	2·9876	·1352
1	·1281	·1173	6	·7852	6·7788
2	15·8782	22·8670	7	·5924	·4312
3	·6229	·6109	8	·4068	·0914
4	·3615	·3483	9	·2247	5·7585
35	·0950	·0792	80	·0488	·4360
6	14·8242	21·8040	1	1·8844	·1288
7	·5509	·5231	2	·7379	4·8415
8	·2752	·2360	3	·6069	·5711
9	·9954	20·9424	4	·4970	·3190
40	13·7103	·6421	85	·4025	·0751
1	·4173	·3341	6	·3139	3·8269
2	·1142	·0182	7	·2224	·5630
3	12·8024	19·6942	8	·1305	·2809
4	·4848	·3634	9	·0122	2·9610
45	·1619	·0251	90	0·8693	·6105
6	11·8379	18·6813	1	·7246	·2498
7	·5148	·3320	2	·5800	1·8776
8	·1921	17·9773	3	·4198	·4826
9	10·8681	·6165	4	·2668	·0872
50	·5428	·2498	95	·1321	0·6983
1	·2140	16·8764	6	·0328	·3238
2	9·8802	·4960			
3	·5434	·1094			
4	·2058	15·7172			

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
10	———	20·9287	20·8243	20·6987	20·5572	20·4046	10
1	27·2150	———	·7494	·6264	·4873	·3371	1
2	·1383	27·0601	———	·5290	·3926	·2451	2
3	·0600	26·9792	26·8955	———	·2773	·1327	3
4	26·9809	·8977	·8113	26·7227	———	·0047	4
15	·9019	·8163	·7272	·6357	26·5431	———	15
6	·8239	·7358	·6440	·5496	·4540	26·3582	6
7	·7476	·6571	·5626	·4655	·3668	·2678	7
8	·6733	·5806	·4835	·3835	·2820	·1800	8
9	·6021	·5070	·4076	·3048	·2004	·0955	9
20	·5334	·4361	·3342	·2290	·1218	·0140	20
1	·4666	·3672	·2629	·1551	·0453	25·9347	1
2	·4011	·2995	·1929	·0825	25·9700	·8568	2
3	·3362	·2325	·1235	·0107	·8955	·7794	3
4	·2715	·1656	·0543	25·9389	·8211	·7022	4
25	·2069	·0991	25·9854	·8674	·7469	·6252	25
6	·1427	·0328	·9169	·7964	·6731	·5485	6
7	·0791	25·9672	·8490	·7260	·6000	·4726	7
8	·0166	·9025	·7821	·6567	·5281	·3978	8
9	25·9548	·8390	·7162	·5884	·4571	·3242	9
30	·8941	·7763	·6516	·5211	·3874	·2517	30
1	·8343	·7147	·5878	·4552	·3187	·1804	1
2	·7752	·6539	·5248	·3898	·2511	·1099	2
3	·7171	·5940	·4629	·3256	·1843	·0407	3
4	·6597	·5349	·4018	·2623	·1184	24·9722	4
35	·6030	·4765	·3415	·1997	·0535	·9047	35
6	·5471	·4191	·2821	·1382	24·9896	·8383	6
7	·4923	·3627	·2239	·0779	·9270	·7731	7
8	·4384	·3073	·1666	·0186	·8654	·7091	8
9	·3854	·2528	·1103	24·9602	·8048	·6462	9
40	·3333	·1992	·0550	·9029	·7452	·5842	40
1	·2819	·1465	·0005	·8464	·6866	·5232	1
2	·2314	·0946	24·9470	·7908	·6288	·4632	2
3	·1815	·0434	·8942	·7362	·5720	·4040	3
4	·1328	24·9934	·8426	·6826	·5164	·3461	4
45	·0849	·9444	·7919	·6301	·4618	.2893	45
6	·0385	·8967	·7427	·5791	·4087	·2341	6
7	24·9932	·8502	·6947	·5293	·3569	·1802	7
8	·9492	·8051	·6482	·4811	·3067	·1279	8
9	·9064	·7612	·6029	·4340	·2578	·0769	9
50	·8647	·7187	·5589	·3883	·2102	·0273	50
1	·8243	·6771	·5161	·3439	·1639	23·9790	1
2	·7850	·6369	·4744	·3007	·1189	·9320	2
3	·7469	·5979	·4342	·2588	·0752	·8864	3
4	·7100	·5602	·3952	·2183	·0329	·8422	4

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
10	20·2460	20·0869	19·9328	19·7892	19·6575	19·5302	10
1	·1810	·0243	·8724	·7312	·6017	·4765	1
2	·0917	19·9377	·7884	·6495	·5225	·3997	2
3	19·9822	·8309	·6845	·5484	·4238	·3036	3
4	·8572	·7090	·5654	·4322	·3104	·1928	4
15	·7214	·5764	·4358	·3055	·1866	·0718	15
6	———	·4379	·3006	·1732	·0572	18·9453	6
7	26·1697	———	·1645	·0404	18·9272	·8182	7
8	·0786	25·9793	———	18·9119	·8018	·6957	8
9	25·9912	·8886	25·7887	———	·6861	·5830	9
20	·9068	·8014	·6984	25·5993	———	·4812	20
1	·8246	·7163	·6104	·5083	25·4097	———	1
2	·7438	·6325	·5238	·4188	·3172	25·2179	2
3	·6636	·5495	·4378	·3300	·2255	·1231	3
4	·5835	·4665	·3518	·2410	·1337	·0284	4
25	·5036	·3836	·2660	·1522	·0419	24·9337	25
6	·4241	·3011	·1805	·0637	24·9505	·8392	6
7	·3452	·2193	·0957	24·9759	·8598	·7455	7
8	·2675	·1386	·0120	·8893	·7701	·6530	8
9	·1910	·0591	24·9296	·8040	·6819	·5617	9
30	·1157	24·9809	·8485	·7200	·5950	·4719	30
1	·0416	·9040	·7687	·6373	·5095	·3835	1
2	24·9684	·8279	·6898	·5556	·4249	·2961	2
3	·8963	·7531	·6122	·4751	·3418	·2100	3
4	·8252	·6792	·5355	·3957	·2596	·1251	4
35	·7550	·6064	·4599	·3174	·1786	·0414	35
6	·6859	·5346	·3855	·2403	·0990	23·9591	6
7	·6183	·4642	·3125	·1649	·0208	·8785	7
8	·5517	·3951	·2408	·0906	23·9442	·7992	8
9	·4862	·3271	·1703	·0176	·8688	·7214	9
40	·4219	·2602	·1010	23·9459	·7947	·6449	40
1	·3585	·1945	·0326	·8753	·7218	·5697	1
2	·2960	·1296	23·9655	·8057	·6500	·4957	2
3	·2345	·0656	·8992	·7372	·5793	·4228	3
4	·1743	·0031	·8343	·6701	·5102	·3515	4
45	·1151	23·9416	·7706	·6043	·4424	·2817	45
6	·0577	·8819	·7086	·5403	·3764	·2138	6
7	·0016	·8237	·6483	·4778	·3121	·1477	7
8	23·9472	·7671	·5896	·4172	·2496	·0834	8
9	·8940	·7119	·5323	·3581	·1888	·0209	9
50	·8424	·6581	·4767	·3006	·1296	22·9600	50
1	·7920	·6057	·4223	·2445	·0719	·9009	1
2	·7430	·5547	·3694	·1899	·0158	·8432	2
3	·6954	·5052	·3180	·1368	22·9612	·7872	3
4	·6492	·4570	·2681	·0853	·9082	·7329	4

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
10	19·4035	19·2718	19·1308	18·9794	18·8193	18·6516	10
1	·3520	·2224	·0836	·9341	·7761	·6104	1
2	·2775	·1503	·0138	·8667	·7109	·5475	2
3	·1840	·0592	18·9253	·7808	·6275	·4666	3
4	·0759	18·9538	·8225	·6807	·5302	·3720	4
15	18·9575	·8383	·7098	·5708	·4232	·2678	15
6	·8339	·7175	·5919	·4558	·3110	·1586	6
7	·7098	·5962	·4735	·3404	·1986	·0491	7
8	·5901	·4795	·3598	·2296	·0908	17·9443	8
9	·4803	·3725	·2558	·1286	17·9928	·8493	9
20	·3815	·2766	·1627	·0385	·9056	·7650	20
1	·2867	·1849	·0739	17·9526	·8228	·6852	1
2	———	·0934	17·9856	·8673	·7406	·6061	2
3	25·0224	———	·8925	·7775	·6539	·5225	3
4	24·9245	24·8210	———	·6788	·5585	·4305	4
25	·8268	·7200	24·6130	———	·4532	·3287	25
6	·7292	·6193	·5090	24·3983	———	·2185	6
7	·6324	·5194	·4057	·2915	24·1774	———	7
8	·5368	·4205	·3037	·1860	·0682	23·9509	8
9	·4426	·3231	·2029	·0819	23·9605	·8394	9
30	·3497	·2272	·1036	23·9792	·8543	·7294	30
1	·2583	·1326	·0058	·8779	·7494	·6210	1
2	·1680	·0392	23·9091	·7778	·6458	·5136	2
3	·0790	23·9473	·8140	·6792	·5436	·4077	3
4	23·9912	·8565	·7200	·5819	·4427	·3031	4
35	·9047	·7670	·6274	·4860	·3432	·2000	35
6	·8196	·6790	·5363	·3916	·2454	·0985	6
7	·7363	·5928	·4471	·2991	·1495	22·9991	7
8	·6545	·5082	·3595	·2083	·0554	·9014	8
9	·5740	·4252	·2736	·1193	22·9630	·8055	9
40	·4952	·3436	·1892	·0319	·8724	·7114	40
1	·4175	·2634	·1062	22·9460	·7833	·6190	1
2	·3412	·1846	·0248	·8615	·6958	·5282	2
3	·2661	·1071	22·9447	·7787	·6098	·4390	3
4	·1927	·0314	·8664	·6977	·5260	·3520	4
45	·1207	22·9572	·7898	·6184	·4439	·2669	45
6	·0509	·8852	·7155	·5416	·3642	·1843	6
7	22·9829	·8152	·6432	·4668	·2868	·1041	7
8	·9168	·7472	·5731	·3944	·2118	·0263	8
9	·8525	·6810	·5049	·3239	·1389	21·9508	9
50	·7900	·6168	·4387	·2555	·0682	·8776	50
1	·7291	·5542	·3743	·1891	21·9995	·8064	1
2	·6700	·4934	·3117	·1245	·9328	·7374	2
3	·6126	·4346	·2511	·0620	·8682	·6705	3
4	·5570	·3774	·1924	·0014	·8056	·6059	4

Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

H^{M}.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
10	18·4790	18·3026	18·1217	17·9368	17·7458	17·5482	10
1	·4400	·2653	·0864	·9033	·7140	·5182	1
2	·3793	·2070	·0300	·8491	·6620	·4682	2
3	·3008	·1309	17·9566	·7778	·5931	·4016	3
4	·2088	·0416	·8697	·6937	·5112	·3223	4
15	·1075	17·9429	·7738	·6004	·4208	·2343	15
6	·0012	·8395	·6732	·5026	·3257	·1421	6
7	17·8947	·7360	·5726	·4048	·2308	·0499	7
8	·7929	·6371	·4766	·3117	·1405	16·9624	8
9	·7008	·5479	·3903	·2283	·0599	·8847	9
20	·6196	·4696	·3149	·1557	16·9902	·8176	20
1	·5426	·3957	·2439	·0876	·9249	·7553	1
2	·4666	·3226	·1739	·0206	·8608	·6941	2
3	·3863	·2455	·0998	16·9497	·7930	·6292	3
4	·2974	·1600	·0177	·8708	·7174	·5568	4
25	·1991	·0650	16·9261	·7827	·6327	·4756	25
6	·0926	16·9621	·8267	·6869	·5404	·3869	6
7	16·9786	·8519	·7203	·5840	·4413	·2915	7
8	——	·7367	·6090	·4766	·3375	·1915	8
9	23·7195	——	·4934	·3649	·2299	·0877	9
30	·6056	23·4830	——	·2486	·1176	15·9796	30
1	·4933	·3668	23·2415	——	·0010	·8670	1
2	·3823	·2517	·1224	22·9943	——	·7483	2
3	·2726	·1382	·0047	·8726	22·7412	——	3
4	·1641	·0258	22·8884	·7520	·6164	22·4819	4
35	·0571	22·9148	·7735	·6330	·4930	·3541	35
6	22·9518	·8057	·6601	·5156	·3713	·2280	6
7	·8487	·6986	·5491	·4002	·2518	·1040	7
8	·7473	·5934	·4398	·2870	·1341	21·9820	8
9	·6478	·4902	·3327	·1756	·0186	·8619	9
40	·5502	·3887	·2274	·0663	21·9050	·7410	40
1	·4541	·2891	·1239	21·9588	·7933	·6279	1
2	·3599	·1912	·0222	·8531	·6835	·5137	2
3	·3674	·0951	21·9223	·7494	·5756	·4016	3
4	·1770	·0013	·8249	·6481	·4704	·2921	4
45	·0887	21·9095	·7296	·5491	·3674	·1851	45
6	·0030	·8206	·6372	·4531	·2677	·0811	6
7	21·9197	·7342	·5475	·3599	·1707	20·9804	7
8	·8391	·6506	·4607	·2697	·0769	·8828	8
9	·7608	·5693	·3764	·1821	20·9859	·7881	9
50	·6849	·4906	·2947	·0973	·8977	·6963	50
1	·6113	·4142	·2155	·0150	·8123	·6075	1
2	·5397	·3401	·1386	20·9353	·7295	·5213	2
3	·4705	·2684	·0643	·8582	·6494	·4381	3
4	·4036	·1991	20·9924	·7838	·5721	·3578	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
10	17·3436	17·1325	16·9154	16·6931	16·4656	16·2319	10
1	·3153	·1059	·8903	·6696	·4436	·2114	1
2	·2673	·0598	·8462	·6273	·4032	·1728	2
3	·2029	16·9977	·7862	·5694	·3473	·1190	3
4	·1262	·9233	·7142	·4997	·2799	·0538	4
15	·0408	·8405	·6339	·4220	·2046	15·9808	15
6	16·9512	·7536	·5497	·3402	·1254	·9042	6
7	·8618	·6668	·4656	·2589	·0466	·8279	7
8	·7771	·5849	·3863	·1822	15·9725	·7563	8
9	·7021	·5126	·3167	·1150	·9079	·6942	9
20	·6378	·4510	·2576	·0587	·8539	·6426	20
1	·5782	·3941	·2034	·0069	·8048	·5959	1
2	·5199	·3386	·1507	15·9569	·7573	·5511	2
3	·4580	·2797	·0947	·9038	·7070	·5033	3
4	·3888	·2136	·0317	·8438	·6500	·4492	4
25	·3109	·1390	15·9604	·7758	·5852	·3875	25
6	·2258	·0575	·8823	·7011	·5138	·3195	6
7	·1341	15·9694	·7979	·6202	·4365	·2457	7
8	·0380	·8772	·7095	·5355	·3555	·1683	8
9	15·9381	·7813	·6174	·4474	·2712	·0877	9
30	·8339	·6810	·5214	·3553	·1832	·0036	30
1	·7256	·5768	·4212	·2595	·0913	14·9160	1
2	·6111	·4667	·3154	·1578	14·9941	·8229	2
3	·4899	·3499	·2030	·0499	·8905	·7239	3
4	———	·2259	·0835	14·9351	·7802	·6181	4
35	22·2161	———	14·9571	·8133	·6633	·5059	35
6	·0855	21·9441	———	·6851	·5398	·3874	6
7	21·9568	·8108	21·6660	———	·4105	·2630	7
8	·8303	·6794	·5299	21·3821	———	·1327	8
9	·7057	·5501	·3956	·2429	21·0918	———	9
40	·5830	·4228	·2635	·1057	20·9495	20·7949	40
1	·4625	·2974	·1332	20·9704	·8090	·6492	1
2	·3437	·1740	·0048	·8370	·6704	·5052	2
3	·2271	·0526	20·8787	·7056	·5339	·3632	3
4	·1132	20·9341	·7552	·5772	·4001	·2242	4
45	·0017	·8181	·6344	·4514	·2693	·0879	45
6	20·8937	·7054	·5171	·3293	·1419	19·9553	6
7	·7886	·5962	·4032	·2105	·0182	·8263	7
8	·6871	·4902	·2929	·0955	19·8983	·7013	8
9	·5884	·3875	·1857	19·9838	·7818	·5798	9
50	·4930	·2880	·0821	·8756	·6690	·4620	50
1	·4001	·1916	19·9814	·7708	·5594	·3477	1
2	·3107	·0981	·8841	·6691	·4535	·2369	2
3	·2241	·0079	·7900	·5710	·3510	·1300	3
4	·1406	19·9209	·6993	·4764	·2523	·0268	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
10	15·9913	15·7422	15·4832	15·2152	14·9397	14·6570	10
1	·9723	·7245	·4669	·2002	·9260	·6444	1
2	·9354	·6894	·4334	·1683	·8957	·6158	2
3	·8836	·6396	·3857	·1224	·8518	·5737	3
4	·8207	·5788	·3271	·0660	·7974	·5214	4
15	·7501	·5106	·2611	·0024	·7361	·4623	15
6	·6758	·4387	·1917	14·9353	·6713	·3999	6
7	·6021	·3673	·1227	·8688	·6071	·3380	7
8	·5329	·3008	·0584	·8068	·5475	·2806	8
9	·4732	·2433	·0034	·7540	·4969	·2321	9
20	·4240	·1964	14·9587	·7115	·4564	·1936	20
1	·3797	·1544	·9189	·6739	·4210	·1602	1
2	·3372	·1144	·8812	·6384	·3876	·1290	2
3	·2922	·0719	·8412	·6008	·3523	·0959	3
4	·2409	·0234	·7953	·5575	·3116	·0576	4
25	·1822	14·9676	·7426	·5075	·2643	·0130	25
6	·1174	·9060	·6840	·4521	·2117	13·9632	6
7	·0471	·8390	·6203	·3916	·1544	·9089	7
8	14·9732	·7688	·5535	·3281	·0943	·8520	8
9	·8965	·6956	·4840	·2622	·0318	·7930	9
30	·8162	·6192	·4114	·1934	13·9666	·7313	30
1	·7326	·5396	·3358	·1216	·8987	·6671	1
2	·6438	·4550	·2553	·0453	·8263	·5987	2
3	·5491	·3647	·1694	13·9636	·7489	·5253	3
4	·4481	·2681	·0774	·8761	·6658	·4467	4
35	·3405	·1654	13·9793	·7828	·5771	·3625	35
6	·2268	·0566	·8755	·6837	·4830	·2732	6
7	·1075	13·9423	·7662	·5797	·3839	·1791	7
8	13·9823	·8223	·6514	·4700	·2796	·0798	8
9	·8502	·6954	·5299	·3540	·1688	12·9745	9
40	—	·5610	·4010	·2306	·0510	·8622	40
1	20·4909	—	·2629	·0981	12·9243	·7413	1
2	·3414	20·1790	—	12·9553	·7874	·6104	2
3	·1939	·0259	19·8592	—	·6405	·4696	3
4	·0493	19·8755	·7029	19·5319	—	·3202	4
45	19·9075	·7279	·5493	·3722	19·1974	—	45
6	·7693	·5841	·3995	·2162	·0352	18·8565	6
7	·6350	·4440	·2536	·0641	18·8768	·6917	7
8	·5045	·3079	·1116	18·9161	·7225	·5309	8
9	·3777	·1756	18·9735	·7719	·5721	·3740	9
50	·2548	·0472	·8393	·6318	·4257	·2213	50
1	·1354	18·9225	·7090	·4956	·2833	·0724	1
2	·0198	·8016	·5825	·3632	·1449	17·9277	2
3	18·9079	·6847	·4602	·2352	·0108	·7874	3
4	·8002	·5718	·3421	·1115	17·8813	·6517	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
10	14·3695	14·0786	13·7839	13·4843	13·1800	12·8693	10
1	·3582	·0685	·7749	·4764	·1729	·8634	1
2	·3311	·0429	·7507	·4536	·1516	·8433	2
3	·2908	·0044	·7139	·4186	·1183	·8116	3
4	·2406	13·9562	·6677	·3742	·0758	·7710	4
15	·1836	·9013	·6149	·3235	·0271	·7243	15
6	·1234	·8433	·5590	·2698	12·9754	·6747	6
7	·0638	·7858	·5037	·2165	·9243	·6256	7
8	·0087	·7328	·4528	·1677	·8773	·5806	8
9	13·9622	·6885	·4104	·1271	·8386	·5436	9
20	·9257	·6538	·3776	·0960	·8092	·5158	20
1	·8942	·6241	·3497	·0698	·7847	·4927	1
2	·8649	·5967	·3241	·0460	·7625	·4723	2
3	·8340	·5678	·2971	·0209	·7391	·4506	3
4	·7980	·5341	·2655	12·9913	·7115	·4248	4
25	·7559	·4945	·2282	·9563	·6787	·3940	25
6	·7090	·4502	·1865	·9170	·6417	·3593	6
7	·6576	·4016	·1407	·8738	·6010	·3211	7
8	·6038	·3509	·0928	·8287	·5586	·2811	8
9	·5480	·2982	·0431	·7820	·5147	·2400	9
30	·4898	·2433	12·9914	·7333	·4690	·1971	30
1	·4292	·1862	·9377	·6829	·4217	·1529	1
2	·3645	·1253	·8804	·6290	·3712	·1055	2
3	·2954	·0599	·8188	·5711	·3169	·0546	3
4	·2208	12·9897	·7525	·5088	·2582	11·9997	4
35	·1413	·9143	·6816	·4419	·1954	·9407	35
6	·0566	·8343	·6059	·3707	·1283	·8779	6
7	12·9673	·7499	·5262	·2955	·0577	·8114	7
8	·8733	·6608	·4420	·2161	11·9829	·7414	8
9	·7732	·5660	·3523	·1314	·9032	·6664	9
40	·6665	·4646	·2564	·0408	·8177	·5860	40
1	·5512	·3551	·1525	11·9424	·7248	·4984	1
2	·4263	·2360	·0393	·8350	·6232	·4024	2
3	·2917	·1076	11·9169	·7187	·5128	·2979	3
4	·1485	11·9707	·7863	·5943	·3947	·1860	4
45	11·9966	·8252	·6473	·4618	·2685	·0663	45
6	———	·6730	·5016	·3227	·1361	10·9403	6
7	18·5100	———	·3501	·1779	10·9979	·8089	7
8	·3427	18·1580	———	·0266	·8535	·6714	8
9	·1792	17·9878	17·8004	———	·7020	·5268	9
50	·0198	·8218	·6275	17·4366	———	·3748	50
1	17·8645	·6597	·4585	·2607	17·0667	———	1
2	·7132	·5017	·2936	·0887	16·8876	16·6899	2
3	·5663	·3482	·1333	16·9214	·7130	·5080	3
4	·4243	·1995	16·9779	·7590	·5434	·3310	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3 PER CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
10	12·5515	12·2279	11·8999	11·5676	11·2321	10·8940	10
1	·5465	·2258	·8966	·5652	·2305	·8931	1
2	·5279	·2064	·8805	·5503	·2168	·8805	2
3	·4977	·1779	·8535	·5249	·1929	·8581	3
4	·4589	·1409	·8183	·4914	·1611	·8280	4
15	·4142	·0981	·7774	·4524	·1239	·7926	15
6	·3666	·0525	·7338	·4106	·0841	·7545	6
7	·3195	·0073	·6906	·3692	·0445	·7169	7
8	·2764	11·9661	·6511	·3316	·0085	·6825	8
9	·2411	·9325	·6191	·3012	10·9797	·6551	9
20	·2148	·9077	·5958	·2791	·9590	·6357	20
1	·1933	·8876	·5770	·2617	·9427	·6206	1
2	·1743	·8700	·5607	·2467	·9290	·6079	2
3	·1543	·8514	·5437	·2310	·9145	·5948	3
4	·1303	·8292	·5230	·2119	·8969	·5785	4
25	·1015	·8023	·4980	·1886	·8753	·5584	25
6	·0689	·7718	·4695	·1620	·8504	·5353	6
7	·0330	·7382	·4379	·1325	·8229	·5096	7
8	11·9956	·7031	·4051	·1019	·7943	·4829	8
9	·9570	·6670	·3714	·0704	·7650	·4556	9
30	·9169	·6295	·3365	·0378	·7347	·4275	30
1	·8755	·5909	·3004	·0043	·7036	·3987	1
2	·8312	·5496	·2620	10·9686	·6704	·3679	2
3	·7837	·5052	·2206	·9301	·6347	·3348	3
4	·7323	·4572	·1758	·8884	·5959	·2989	4
35	·6771	·4056	·1277	·8436	·5542	·2602	35
6	·6181	·3505	·0763	·7957	·5098	·2190	6
7	·5560	·2924	·0221	·7453	·4629	·1755	7
8	·4902	·2310	10·9648	·6920	·4134	·1297	8
9	·4201	·1653	·9036	·6349	·3605	·0806	9
40	·3445	·0947	·8375	·5734	·3033	·0276	40
1	·2622	·0174	·7654	·5060	·2405	9·9692	1
2	·1718	10·9324	·6856	·4314	·1708	·9043	2
3	·0732	·8395	·5983	·3495	·0943	·8328	3
4	10·9673	·7397	·5043	·2613	·0116	·7556	4
45	·8539	·6325	·4033	·1663	9·9225	·6721	45
6	·7345	·5197	·2968	·0660	·8283	·5839	6
7	·6098	·4016	·1854	9·9611	·7297	·4914	7
8	·4792	·2778	·0683	·8508	·6259	·3942	8
9	·3417	·1473	9·9448	·7342	·5162	·2910	9
50	·1968	·0097	·8144	·6109	·3999	·1817	50
1	·0434	9·8636	·6757	·4795	·2758	·0648	1
2		·7080	·5276	·3390	·1428	8·9392	2
3	16·3065		·3707	·1898	·0013	·8054	3
4	·1220	15·9172		·0328	8·8521	·6641	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hᴹ.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
10	10·5534	10·2104	9·8667	9·5234	9·1815	8·8418	10
1	·5533	·2109	·8678	·5251	·1837	·8445	1
2	·5417	·2004	·8583	·5166	·1761	·8379	2
3	·5207	·1806	·8399	·4995	·1603	·8231	3
4	·4922	·1538	·8145	·4756	·1379	·8022	4
15	·4586	·1219	·7844	·4470	·1109	·7767	15
6	·4224	·0874	·7517	·4160	·0815	·7489	6
7	·3864	·0532	·7191	·3851	·0522	·7211	7
8	·3538	·0221	·6896	·3571	·0256	·6959	8
9	·3277	9·9975	·6662	·3350	·0047	·6762	9
20	·3094	·9804	·6503	·3200	8·9907	·6631	20
1	·2955	·9674	·6382	·3090	·9805	·6538	1
2	·2839	·9569	·6286	·3003	·9727	·6467	2
3	·2719	·9460	·6187	·2913	·9645	·6394	3
4	·2570	·9322	·6061	·2798	·9541	·6299	4
25	·2383	·9150	·5902	·2651	·9406	·6174	25
6	·2168	·8950	·5717	·2480	·9247	·6028	6
7	·1929	·8727	·5510	·2288	·9070	·5864	7
8	·1680	·8497	·5296	·2089	·8885	·5694	8
9	·1427	·8262	·5078	·1888	·8699	·5522	9
30	·1166	·8020	·4855	·1682	·8509	·5347	30
1	·0900	·7774	·4628	·1472	·8317	·5170	1
2	·0616	·7511	·4386	·1249	·8112	·4982	2
3	·0308	·7228	·4125	·1009	·7891	·4780	3
4	9·9976	·6921	·3841	·0748	·7651	·4559	4
35	·9618	·6590	·3536	·0467	·7392	·4322	35
6	·9236	·6237	·3211	·0167	·7117	·4069	6
7	·8834	·5866	·2868	8·9853	·6828	·3804	7
8	·8410	·5475	·2508	·9522	·6525	·3527	8
9	·7956	·5056	·2123	·9168	·6200	·3230	9
40	·7465	·4603	·1705	·8784	·5849	·2909	40
1	·6925	·4102	·1244	·8359	·5459	·2551	1
2	·6321	·3544	·0726	·7882	·5018	·2147	2
3	·5656	·2925	·0153	·7351	·4529	·1695	3
4	·4935	·2254	8·9531	·6775	·3996	·1203	4
45	·4156	·1528	·8855	·6148	·3416	·0667	45
6	·3331	·0760	·8140	·5484	·2801	·0099	6
7	·2467	8·9953	·7390	·4788	·2156	7·9503	7
8	·1556	·9103	·6599	·4054	·1476	·8874	8
9	·0591	·8201	·5758	·3272	·0751	·8204	9
50	8·9565	·7242	·4864	·2439	7·9978	·7489	50
1	·8467	·6213	·3902	·1543	·9145	·6716	1
2	·7284	·5103	·2862	·0572	·8240	·5876	2
3	·6022	·3915	·1748	7·9529	·7267	·4970	3
4	·4686	·2656	·0565	·8421	·6230	·4003	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
10	8·5052	8·1707	7·8373	7·5041	7·1706	6·8347	10
1	·5084	·1742	·8412	·5084	·1752	·8394	1
2	·5026	·1693	·8370	·5049	·1723	·8372	2
3	·4890	·1568	·8257	·4946	·1630	·8289	3
4	·4694	·1386	·8087	·4789	·1485	·8155	4
15	·4455	·1160	·7876	·4592	·1302	·7985	15
6	·4192	·0913	·7642	·4373	·1096	·7793	6
7	·3928	·0664	·7408	·4151	·0889	·7599	7
8	·3690	·0438	·7195	·3950	·0699	·7421	8
9	·3504	·0263	·7030	·3796	·0554	·7285	9
20	·3383	·0149	·6924	·3697	·0463	·7200	20
1	·3296	·0071	·6852	·3631	·0403	·7146	1
2	·3233	·0013	·6801	·3586	·0363	·7110	2
3	·3167	7·9956	·6749	·3541	·0323	·7076	3
4	·3081	·9878	·6680	·3478	·0267	·7026	4
25	·2967	·9774	·6585	·3391	·0188	·6955	25
6	·2832	·9649	·6471	·3287	·0093	·6868	6
7	·2680	·9509	·6341	·3168	6·9984	·6768	7
8	·2523	·9364	·6208	·3045	·9872	·6666	8
9	·2365	·9218	·6074	·2922	·9759	·6563	9
30	·2204	·9071	·5938	·2799	·9646	·6460	30
1	·2042	·8922	·5803	·2675	·9534	·6359	1
2	·1870	·8765	·5659	·2545	·9415	·6251	2
3	·1684	·8595	·5504	·2403	·9287	·6135	3
4	·1482	·8410	·5335	·2249	·9147	·6008	4
35	·1264	·8211	·5154	·2084	·8996	·5871	35
6	·1033	·7999	·4960	·1908	·8836	·5726	6
7	·0791	·7779	·4759	·1725	·8671	·5576	7
8	·0538	·7548	·4549	·1535	·8499	·5421	8
9	·0266	·7301	·4325	·1332	·8315	·5256	9
40	7·9973	·7034	·4083	·1112	·8117	·5078	40
1	·9646	·6735	·3811	·0866	·7894	·4878	1
2	·9275	·6396	·3501	·0584	·7639	·4646	2
3	·8860	·6016	·3153	·0266	·7349	·4383	3
4	·8407	·5599	·2772	6·9917	·7031	·4094	4
45	·7913	·5145	·2354	·9535	·6682	·3777	45
6	·7389	·4662	·1912	·9130	·6312	·3440	6
7	·6840	·4157	·1448	·8705	·5925	·3088	7
8	·6260	·3624	·0959	·8258	·5517	·2717	8
9	·5642	·3055	·0437	·7780	·5082	·2321	9
50	·4981	·2447	6·9878	·7270	·4615	·1897	50
1	·4267	·1788	·9272	·6714	·4108	·1435	1
2	·3487	·1067	·8609	·6104	·3549	·0926	2
3	·2646	·0289	·7890	·5443	·2943	·0371	3
4	·1747	6·9455	·7119	·4732	·2290	5·9774	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
10	6·4997	6·1687	5·8462	5·5362	5·2429	4·9661	10
1	·5047	·1738	·8513	·5414	·2481	·9713	1
2	·5030	·1727	·8507	·5412	·2483	·9718	2
3	·4956	·1661	·8449	·5361	·2438	·9680	3
4	·4834	·1550	·8348	·5269	·2356	·9605	4
15	·4676	·1405	·8214	·5147	·2243	·9502	15
6	·4498	·1239	·8060	·5004	·2111	·9380	6
7	·4316	·1069	·7902	·4857	·1974	·9253	7
8	·4150	·0914	·7757	·4722	·1848	·9135	8
9	·4023	·0795	·7647	·4619	·1752	·9045	9
20	·3944	·0723	·7580	·4557	·1694	·8992	20
1	·3894	·0677	·7539	·4520	·1661	·8962	1
2	·3864	·0651	·7515	·4500	·1644	·8947	2
3	·3834	·0625	·7494	·4481	·1628	·8934	3
4	·3790	·0586	·7460	·4452	·1602	·8912	4
25	·3726	·0529	·7408	·4406	·1561	·8875	25
6	·3647	·0457	·7344	·4347	·1508	·8827	6
7	·3556	·0374	·7268	·4278	·1446	·8770	7
8	·3462	·0289	·7190	·4208	·1382	·8712	8
9	·3369	·0204	·7113	·4138	·1318	·8654	9
30	·3275	·0119	·7036	·4068	·1255	·8598	30
1	·3183	·0036	·6962	·4001	·1194	·8543	1
2	·3086	5·9948	·6882	·3930	·1130	·8485	2
3	·2980	·9853	·6797	·3852	·1061	·8422	3
4	·2866	·9750	·6703	·3768	·0985	·8354	4
35	·2742	·9638	·6602	·3677	·0903	·8279	35
6	·2611	·9520	·6496	·3581	·0816	·8201	6
7	·2476	·9398	·6386	·3483	·0728	·8122	7
8	·2337	·9273	·6275	·3383	·0638	·8042	8
9	·2189	·9141	·6156	·3277	·0544	·7958	9
40	·2029	·8998	·6029	·3163	·0443	·7868	40
1	·1848	·8836	·5884	·3034	·0327	·7765	1
2	·1640	·8648	·5715	·2883	·0192	·7643	2
3	·1402	·8434	·5522	·2709	·0035	·7502	3
4	·1140	·8197	·5308	·2516	4·9861	·7346	4
45	·0851	·7935	·5072	·2302	·9668	·7171	45
6	·0546	·7658	·4821	·2076	·9463	·6986	6
7	·0226	·7370	·4560	·1840	·9251	·6795	7
8	5·9891	·7066	·4286	·1593	·9028	·6594	8
9	·9532	·6742	·3994	·1330	·8791	·6381	9
50	·9148	·6395	·3681	·1048	·8537	·6152	50
1	·8728	·6015	·3338	·0739	·8259	·5902	1
2	·8265	·5595	·2958	·0396	·7949	·5622	2
3	·7760	·5136	·2542	·0019	·7608	·5314	3
4	·7215	·4640	·2092	4·9611	·7239	·4980	4

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^{M}.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
10	4·6958	4·4340	4·1791	3·9287	3·6859	3·4558	10
1	·7010	·4391	·1840	·9335	·6906	·4604	1
2	·7018	·4401	·1853	·9349	·6920	·4619	2
3	·6985	·4374	·1830	·9330	·6905	·4607	3
4	·6918	·4314	·1777	·9283	·6864	·4571	4
15	·6824	·4228	·1699	·9213	·6801	·4514	15
6	·6712	·4125	·1604	·9126	·6722	·4442	6
7	·6594	·4015	·1503	·9033	·6637	·4364	7
8	·6484	·3913	·1409	·8946	·6556	·4290	8
9	·6400	·3836	·1336	·8879	·6494	·4232	9
20	·6351	·3790	·1294	·8840	·6458	·4199	20
1	·6323	·3765	·1271	·8819	·6439	·4182	1
2	·6311	·3754	·1262	·8811	·6433	·4177	2
3	·6300	·3746	·1256	·8807	·6429	·4174	3
4	·6281	·3729	·1242	·8795	·6419	·4166	4
25	·6248	·3700	·1216	·8772	·6400	·4149	25
6	·6205	·3662	·1182	·8741	·6372	·4124	6
7	·6154	·3615	·1139	·8703	·6338	·4094	7
8	·6101	·3567	·1096	·8664	·6302	·4062	8
9	·6049	·3520	·1053	·8626	·6268	·4031	9
30	·5997	·3473	·1011	·8588	·6234	·4000	30
1	·5948	·3429	·0972	·8553	·6203	·3972	1
2	·5896	·3383	·0930	·8516	·6170	·3943	2
3	·5840	·3332	·0885	·8475	·6134	·3911	3
4	·5778	·3277	·0835	·8431	·6094	·3875	4
35	·5711	·3216	·0781	·8382	·6051	·3836	35
6	·5641	·3153	·0724	·8331	·6005	·3796	6
7	·5570	·3089	·0667	·8280	·5960	·3755	7
8	·5498	·3026	·0610	·8230	·5915	·3716	8
9	·5423	·2959	·0552	·8178	·5869	·3675	9
40	·5344	·2889	·0489	·8123	·5821	·3633	40
1	·5252	·2807	·0417	·8060	·5765	·3584	1
2	·5143	·2710	·0331	·7983	·5697	·3524	2
3	·5017	·2597	·0230	·7893	·5617	·3453	3
4	·4876	·2470	·0116	·7792	·5527	·3372	4
45	·4718	·2329	3·9989	·7677	·5425	·3281	45
6	·4552	·2179	·9854	·7556	·5316	·3184	6
7	·4379	·2024	·9715	·7432	·5205	·3085	7
8	·4199	·1862	·9571	·7303	·5091	·2983	8
9	·4007	·1690	·9417	·7167	·4969	·2875	9
50	·3802	·1507	·9253	·7021	·4839	·2760	50
1	·3577	·1305	·9073	·6860	·4697	·2633	1
2	·3326	·1079	·8870	·6679	·4535	·2490	2
3	·3048	·0829	·8646	·6478	·4356	·2330	3
4	·2746	·0557	·8402	·6260	·4161	·2156	4

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴍ.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
10	3·2441	3·0480	2·8711	2·7056	2·5407	2·3665	10
1	·2484	·0522	·8751	·7095	·5444	·3700	1
2	·2501	·0540	·8769	·7114	·5463	·3719	2
3	·2492	·0533	·8765	·7112	·5463	·3721	3
4	·2460	·0505	·8741	·7091	·5447	·3708	4
15	·2409	·0459	·8700	·7055	·5414	·3681	15
6	·2344	·0400	·8646	·7006	·5370	·3642	6
7	·2272	·0334	·8585	·6950	·5319	·3596	7
8	·2203	·0270	·8525	·6895	·5269	·3550	8
9	·2150	·0220	·8480	·6852	·5229	·3513	9
20	·2119	·0192	·8454	·6828	·5206	·3493	20
1	·2103	·0178	·8440	·6816	·5195	·3483	1
2	·2099	·0174	·8438	·6813	·5194	·3481	2
3	·2098	·0174	·8438	·6814	·5195	·3483	3
4	·2091	·0169	·8433	·6811	·5193	·3482	4
25	·2076	·0155	·8422	·6801	·5185	·3475	25
6	·2054	·0136	·8405	·6786	·5171	·3464	6
7	·2026	·0111	·8382	·6766	·5153	·3448	7
8	·1998	·0085	·8359	·6745	·5135	·3432	8
9	·1970	·0060	·8336	·6725	·5117	·3416	9
30	·1943	·0036	·8315	·6705	·5099	·3401	30
1	·1918	·0013	·8295	·6687	·5084	·3387	1
2	·1891	2·9990	·8274	·6669	·5068	·3373	2
3	·1863	·9964	·8251	·6649	·5050	·3358	3
4	·1831	·9936	·8225	·6626	·5029	·3340	4
35	·1796	·9905	·8197	·6600	·5007	·3320	35
6	·1760	·9872	·8168	·6574	·4983	·3300	6
7	·1724	·9840	·8139	·6548	·4961	·3280	7
8	·1688	·9809	·8112	·6524	·4939	·3261	8
9	·1653	·9777	·8084	·6500	·4919	·3243	9
40	·1616	·9745	·8056	·6476	·4898	·3226	40
1	·1573	·9707	·8023	·6447	·4873	·3205	1
2	·1520	·9661	·7982	·6411	·4842	·3179	2
3	·1456	·9604	·7932	·6366	·4803	·3145	3
4	·1384	·9540	·7874	·6315	·4758	·3106	4
45	·1303	·9467	·7809	·6257	·4706	·3061	45
6	·1216	·9389	·7739	·6195	·4651	·3013	6
7	·1128	·9310	·7668	·6132	·4595	·2964	7
8	·1036	·9229	·7596	·6067	·4539	·2915	8
9	·0940	·9143	·7520	·6000	·4479	·2864	9
50	·0838	·9052	·7439	·5929	·4417	·2810	50
1	·0726	·8953	·7351	·5851	·4349	·2752	1
2	·0598	·8839	·7250	·5761	·4270	·2684	2
3	·0455	·8712	·7137	·5661	·4182	·2607	3
4	·0300	·8573	·7013	·5551	·4086	·2524	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
10	2·1829	1·9673	1·7242	1·4747	1·2194	0·9446	10
1	·1862	·9702	·7267	·4768	·2210	·9458	1
2	·1881	·9720	·7283	·4781	·2221	·9466	2
3	·1885	·9725	·7288	·4787	·2227	·9470	3
4	·1875	·9719	·7285	·4786	·2226	·9470	4
15	·1852	·9701	·7272	·4776	·2220	·9467	15
6	·1819	·9673	·7250	·4760	·2209	·9460	6
7	·1778	·9639	·7222	·4739	·2193	·9449	7
8	·1737	·9603	·7192	·4714	·2175	·9436	8
9	·1704	·9574	·7167	·4694	·2159	·9425	9
20	·1685	·9557	·7153	·4682	·2149	·9417	20
1	·1676	·9549	·7145	·4675	·2144	·9413	1
2	·1675	·9548	·7145	·4675	·2143	·9413	2
3	·1677	·9551	·7147	·4677	·2145	·9414	3
4	·1677	·9551	·7148	·4678	·2146	·9415	4
25	·1672	·9547	·7145	·4676	·2145	·9414	25
6	·1662	·9539	·7139	·4672	·2142	·9413	6
7	·1648	·9528	·7130	·4665	·2137	·9409	7
8	·1634	·9516	·7121	·4658	·2131	·9405	8
9	·1620	·9505	·7111	·4650	·2126	·9402	9
30	·1607	·9494	·7102	·4643	·2121	·9398	30
1	·1596	·9484	·7095	·4638	·2116	·9395	1
2	·1584	·9475	·7088	·4632	·2112	·9392	2
3	·1571	·9464	·7079	·4626	·2108	·9390	3
4	·1556	·9452	·7069	·4618	·2103	·9386	4
35	·1539	·9438	·7058	·4610	·2096	·9382	35
6	·1521	·9422	·7046	·4600	·2089	·9377	6
7	·1504	·9408	·7034	·4591	·2082	·9372	7
8	·1488	·9395	·7023	·4582	·2076	·9367	8
9	·1473	·9382	·7014	·4575	·2070	·9363	9
40	·1459	·9371	·7005	·4568	·2065	·9360	40
1	·1442	·9358	·6995	·4561	·2060	·9357	1
2	·1420	·9340	·6981	·4551	·2054	·9353	2
3	·1392	·9317	·6964	·4538	·2044	·9347	3
4	·1359	·9291	·6943	·4522	·2033	·9339	4
45	·1320	·9258	·6917	·4502	·2018	·9329	45
6	·1279	·9224	·6889	·4481	·2002	·9319	6
7	·1237	·9189	·6861	·4459	·1986	·9308	7
8	·1195	·9154	·6834	·4438	·1971	·9297	8
9	·1151	·9119	·6805	·4416	·1955	·9286	9
50	·1106	·9082	·6776	·4394	·1939	·9275	50
1	·1057	·9041	·6745	·4370	·1921	·9264	1
2	·0999	·8994	·6707	·4342	·1901	·9250	2
3	·0935	·8941	·6665	·4309	·1878	·9234	3
4	·0863	·8883	·6619	·4274	·1852	·9217	4

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
10	0·6728	0·4129	0·1775	10
1	·6735	·4134	·1776	1
2	·6741	·4137	·1777	2
3	·6744	·4138	·1778	3
4	·6744	·4139	·1778	4
15	·6743	·4138	·1778	15
6	·6739	·4136	·1777	6
7	·6732	·4133	·1776	7
8	·6724	·4129	·1775	8
9	·6716	·4125	·1773	9
20	·6712	·4122	·1772	20
1	·6709	·4120	·1771	1
2	·6708	·4120	·1771	2
3	·6709	·4120	·1771	3
4	·6710	·4121	·1771	4
25	·6710	·4121	·1771	25
6	·6709	·4120	·1771	6
7	·6707	·4119	·1771	7
8	·6704	·4118	·1770	8
9	·6702	·4117	·1770	9
30	·6699	·4115	·1769	30
1	·6698	·4114	·1769	1
2	·6696	·4113	·1769	2
3	·6694	·4113	·1768	3
4	·6692	·4112	·1768	4
35	·6690	·4110	·1768	35
6	·6687	·4109	·1767	6
7	·6683	·4107	·1766	7
8	·6681	·4105	·1766	8
9	·6678	·4104	·1765	9
40	·6676	·4103	·1765	40
1	·6674	·4102	·1765	1
2	·6672	·4101	·1764	2
3	·6668	·4099	·1763	3
4	·6664	·4097	·1763	4
45	·6658	·4094	·1762	45
6	·6651	·4090	·1760	6
7	·6644	·4086	·1759	7
8	·6638	·4083	·1758	8
9	·6631	·4079	·1756	9
50	·6624	·4076	·1755	50
1	·6617	·4072	·1754	1
2	·6609	·4068	·1752	2
3	·6599	·4063	·1750	3
4	·6589	·4057	·1748	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
55	24·6746	24·5239	24·3577	24·1792	23·9921	23·7995	55
6	·6405	·4890	·3216	·1416	·9528	·7584	6
7	·6077	·4555	·2870	·1055	·9150	·7188	7
8	·5763	·4233	·2538	·0709	·8788	·6808	8
9	·5463	·3927	·2221	·0380	·8442	·6445	9
60	·5176	·3634	·1918	·0063	·8111	·6096	60
1	·4905	·3357	·1631	23·9763	·7796	·5766	1
2	·4647	·3094	·1359	·9478	·7496	·5450	2
3	·4403	·2845	·1100	·9209	·7212	·5151	3
4	·4173	·2610	·0857	·8954	·6944	·4867	4
65	·3956	·2390	·0628	·8714	·6690	·4600	65
6	·3752	·2182	·0413	·8487	·6451	·4346	6
7	·3561	·1987	·0211	·8275	·6226	·4107	7
8	·3380	·1803	·0021	·8075	·6014	·3881	8
9	·3210	·1632	23·9843	·7887	·5815	·3669	9
70	·3052	·1471	·9677	·7712	·5628	·3470	70
1	·2906	·1324	·9524	·7551	·5456	·3285	1
2	·2770	·1188	·9383	·7402	·5297	·3115	2
3	·2648	·1065	·9256	·7268	·5154	·2960	3
4	·2537	·0954	·9141	·7147	·5023	·2820	4
75	·2437	·0854	·9038	·7037	·4906	·2693	75
6	·2346	·0763	·8944	·6938	·4799	·2577	6
7	·2262	·0680	·8859	·6847	·4701	·2471	7
8	·2184	·0604	·8780	·6764	·4611	·2373	8
9	·2113	·0534	·8709	·6689	·4530	·2284	9
80	·2049	·0471	·8646	·6622	·4457	·2204	80
1	·1992	·0415	·8589	·6562	·4392	·2133	1
2	·1940	·0366	·8538	·6508	·4334	·2069	2
3	·1894	·0321	·8492	·6460	·4282	·2012	3
4	·1853	·0282	·8453	·6418	·4236	·1961	4
85	·1816	·0246	·8416	·6379	·4191	·1914	85
6	·1781	·0213	·8383	·6344	·4154	·1871	6
7	·1746	·0180	·8350	·6309	·4116	·1827	7
8	·1712	·0148	·8318	·6275	·4079	·1786	8
9	·1677	·0117	·8288	·6244	·4044	·1746	9
90	·1641	·0085	·8258	·6214	·4011	·1708	90
1	·1609	·0057	·8233	·6188	·3983	·1677	1
2	·1578	·0031	·8209	·6164	·3959	·1649	2
3	·1550	·0007	·8188	·6145	·3939	·1626	3
4	·1526	23·9988	·8171	·6129	·3923	·1608	4
95	·1507	·9971	·8157	·6117	·3910	·1595	95
6	·1492	·9960	·8148	·6108	·3902	·1586	6

[141] Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
55	23·6047	23·4107	23·2199	23·0355	22·8572	22·6805	55
6	·5616	·3658	·1734	22·9874	·8077	·6299	6
7	·5203	·3225	·1285	·9411	·7601	·5811	7
8	·4804	·2810	·0852	·8965	·7144	·5342	8
9	·4424	·2412	·0439	·8537	·6704	·4893	9
60	·4057	·2029	·0040	·8126	·6281	·4461	60
1	·3710	·1665	22·9661	·7734	·5880	·4049	1
2	·3378	·1317	·9299	·7360	·5496	·3657	2
3	·3063	·0987	·8955	·7004	·5131	·3283	3
4	·2764	·0674	·8628	·6666	·4783	·2929	4
65	·2481	·0376	·8318	·6345	·4455	·2592	65
6	·2214	·0094	·8023	·6040	·4142	·2273	6
7	·1960	22·9828	·7745	·5751	·3846	·1971	7
8	·1721	·9574	·7480	·5477	·3564	·1683	8
9	·1495	·9335	·7229	·5217	·3298	·1411	9
70	·1282	·9110	·6992	·4971	·3046	·1155	70
1	·1085	·8901	·6772	·4743	·2811	·0916	1
2	·0903	·8707	·6568	·4530	·2593	·0693	2
3	·0737	·8530	·6381	·4336	·2394	·0490	3
4	·0586	·8369	·6211	·4159	·2213	·0305	4
75	·0449	·8222	·6056	·3998	·2047	·0136	75
6	·0323	·8087	·5913	·3849	·1894	21·9981	6
7	·0208	·7964	·5782	·3711	·1753	·9837	7
8	·0102	·7849	·5659	·3584	·1622	·9704	8
9	·0005	·7744	·5547	·3466	·1501	·9581	9
80	22·9917	·7648	·5445	·3359	·1391	·9469	80
1	·9839	·7563	·5353	·3263	·1292	·9368	1
2	·9768	·7486	·5271	·3176	·1203	·9278	2
3	·9705	·7417	·5197	·3099	·1123	·9196	3
4	·9649	·7356	·5132	·3029	·1051	·9124	4
85	·9597	·7299	·5070	·2965	·0985	·9056	85
6	·9549	·7246	·5012	·2904	·0923	·8993	6
7	·9500	·7192	·4954	·2843	·0859	·8928	7
8	·9453	·7140	·4897	·2782	·0797	·8865	8
9	·9408	·7088	·4840	·2721	·0734	·8801	9
90	·9364	·7038	·4784	·2661	·0671	·8738	90
1	·9327	·6994	·4735	·2607	·0615	·8681	1
2	·9294	·6956	·4690	·2558	·0564	·8628	2
3	·9267	·6924	·4653	·2516	·0520	·8583	3
4	·9246	·6899	·4623	·2483	·0483	·8545	4
95	·9231	·6880	·4600	·2456	·0455	·8516	95
6	·9221	·6868	·4585	·2439	·0436	·8496	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hᴍ.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
55	22·5033	22·3224	22·1358	21·9431	21·7454	21·5436	55
6	·4514	·2693	·0812	·8868	·6874	·4836	6
7	·4016	·2181	·0287	·8328	·6316	·4260	7
8	·3536	·1690	21·9782	·7809	·5781	·3707	8
9	·3076	·1219	·9300	·7312	·5269	·3179	9
60	·2635	·0768	·8837	·6836	·4778	·2672	60
1	·2214	·0338	·8396	·6383	·4311	·2190	1
2	·1813	21·9929	·7976	·5951	·3867	·1731	2
3	·1432	·9539	·7577	·5542	·3445	·1296	3
4	·1070	·9170	·7199	·5153	·3045	·0884	4
65	·0728	·8819	·6840	·4784	·2666	·0493	65
6	·0402	·8488	·6500	·4435	·2306	·0123	6
7	·0094	·8173	·6179	·4106	·1967	20·9773	7
8	21·9801	·7875	·5874	·3793	·1645	·9441	8
9	·9525	·7593	·5586	·3497	·1341	·9128	9
70	·9263	·7327	·5314	·3218	·1054	·8832	70
1	·9020	·7080	·5062	·2959	·0788	·8558	1
2	·8795	·6850	·4827	·2719	·0540	·8303	2
3	·8588	·6641	·4613	·2499	·0315	·8071	3
4	·8400	·6450	·4419	·2300	·0110	·7859	4
75	·8229	·6276	·4241	·2118	20·9923	·7667	75
6	·8071	·6116	·4078	·1951	·9751	·7489	6
7	·7926	·5968	·3928	·1797	·9592	·7326	7
8	·7791	·5831	·3788	·1654	·9445	·7175	8
9	·7667	·5705	·3660	·1523	·9311	·7036	9
80	·7553	·5591	·3544	·1403	·9188	·6909	80
1	·7451	·5488	·3439	·1296	·9078	·6795	1
2	·7360	·5395	·3345	·1200	·8979	·6694	2
3	·7278	·5312	·3260	·1114	·8890	·6602	3
4	·7204	·5238	·3186	·1037	·8811	·6521	4
85	·7137	·5170	·3116	·0966	·8738	·6445	85
6	·7072	·5105	·3050	·0898	·8669	·6374	6
7	·7008	·5040	·2984	·0831	·8599	·6302	7
8	·6944	·4976	·2919	·0764	·8531	·6232	8
9	·6880	·4911	·2854	·0698	·8463	·6161	9
90	·6816	·4848	·2790	·0633	·8396	·6092	90
1	·6759	·4791	·2733	·0575	·8336	·6030	1
2	·6707	·4739	·2681	·0522	·8282	·5974	2
3	·6661	·4694	·2636	·0477	·8235	·5926	3
4	·6624	·4657	·2599	·0439	·8197	·5886	4
95	·6594	·4628	·2570	·0410	·8168	·5856	95
6	·6574	·4608	·2551	·0391	·8148	·5835	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
55	21·3391	21·1324	20·9234	20·7122	20·4978	20·2806	55
6	·2771	·0682	·8569	·6433	·4264	·2064	6
7	·2176	·0067	·7932	·5773	·3580	·1354	7
8	·1605	20·9476	·7321	·5140	·2923	·0674	8
9	·1058	·8911	·6737	·4536	·2298	·0024	9
60	·0535	·8371	·6178	·3958	·1699	19·9403	60
1	·0038	·7857	·5647	·3410	·1132	·8815	1
2	20·9565	·7369	·5143	·2888	·0592	·8256	2
3	·9115	·6905	·4664	·2394	·0081	·7726	3
4	·8690	·6466	·4211	·1926	19·9597	·7226	4
65	·8287	·6051	·3782	·1484	·9140	·6753	65
6	·7905	·5657	·3377	·1065	·8708	·6306	6
7	·7545	·5286	·2993	·0670	·8299	·5884	7
8	·7202	·4933	·2630	·0295	·7913	·5484	8
9	·6879	·4600	·2287	19·9941	·7548	·5107	9
70	·6575	·4286	·1964	·9609	·7205	·4754	70
1	·6292	·3995	·1664	·9300	·6887	·4425	1
2	·6030	·3725	·1386	·9013	·6592	·4120	2
3	·5790	·3478	·1132	·8752	·6322	·3843	3
4	·5572	·3254	·0901	·8515	·6078	·3590	4
75	·5374	·3050	·0690	·8298	·5855	·3361	75
6	·5191	·2861	·0497	·8099	·5650	·3149	6
7	·5023	·2688	·0319	·7916	·5461	·2955	7
8	·4867	·2528	·0154	·7746	·5287	·2775	8
9	·4724	·2380	·0002	·7590	·5126	·2610	9
80	·4594	·2246	19·9864	·7448	·4980	·2459	80
1	·4476	·2125	·9740	·7321	·4849	·2324	1
2	·4371	·2017	·9628	·7206	·4732	·2203	2
3	·4277	·1920	·9528	·7104	·4626	·2095	3
4	·4193	·1834	·9439	·7012	·4532	·1998	4
85	·4115	·1753	·9357	·6928	·4445	·1908	85
6	·4041	·1677	·9279	·6847	·4362	·1823	6
7	·3967	·1601	·9200	·6767	·4280	·1738	7
8	·3895	·1527	·9124	·6688	·4199	·1655	8
9	·3822	·1451	·9046	·6609	·4117	·1571	9
90	·3750	·1378	·8971	·6531	·4037	·1489	90
1	·3686	·1312	·8903	·6461	·3966	·1415	1
2	·3629	·1252	·8841	·6399	·3902	·1349	2
3	·3579	·1200	·8788	·6344	·3846	·1291	3
4	·3538	·1158	·8745	·6299	·3800	·1245	4
95	·3506	·1125	·8711	·6265	·3765	·1208	95
6	·3485	·1103	·8688	·6241	·3740	·1184	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
55	20·0603	19·8373	19·6122	19·3855	19·1574	18·9278	55
6	19·9832	·7571	·5285	·2983	·0664	·8326	6
7	·9093	·6802	·4484	·2148	18·9792	·7416	7
8	·8386	·6066	·3718	·1349	·8959	·6546	8
9	·7711	·5364	·2987	·0587	·8164	·5716	9
60	·7067	·4694	·2289	18·9861	·7407	·4925	60
1	·6456	·4059	·1629	·9172	·6689	·4176	1
2	·5876	·3457	·1002	·8520	·6009	·3467	2
3	·5327	·2886	·0409	·7903	·5366	·2796	3
4	·4808	·2348	18·9849	·7320	·4759	·2164	4
65	·4318	·1839	·9321	·6770	·4187	·1567	65
6	·3855	·1358	·8822	·6252	·3648	·1005	6
7	·3418	·0905	·8351	·5763	·3139	·0475	7
8	·3004	·0477	·7907	·5301	·2659	17·9976	8
9	·2614	·0073	·7488	·4867	·2208	·9506	9
70	·2248	18·9694	·7095	·4459	·1784	·9065	70
1	·1908	·9342	·6730	·4081	·1392	·8657	1
2	·1594	·9017	·6393	·3732	·1029	·8281	2
3	·1307	·8720	·6086	·3413	·0699	·7938	3
4	·1046	·8450	·5807	·3124	·0400	·7627	4
75	·0809	·8206	·5554	·2862	·0128	·7345	75
6	·0591	·7980	·5320	·2620	17·9878	·7086	6
7	·0390	·7773	·5106	·2399	·9648	·6848	7
8	·0205	·7581	·4908	·2194	·9437	·6628	8
9	·0034	·7405	·4726	·2006	·9242	·6427	9
80	18·9879	·7244	·4560	·1834	·9065	·6244	80
1	·9740	·7101	·4411	·1681	·8906	·6080	1
2	·9615	·6972	·4278	·1543	·8765	·5933	2
3	·9503	·6856	·4159	·1420	·8637	·5802	3
4	·9404	·6754	·4053	·1311	·8524	·5685	4
85	·9311	·6659	·3955	·1210	·8420	·5577	85
6	·9224	·6568	·3862	·1113	·8321	·5474	6
7	·9136	·6478	·3768	·1017	·8222	·5373	7
8	·9050	·6389	·3677	·0923	·8125	·5273	8
9	·8963	·6299	·3585	·0828	·8027	·5173	9
90	·8879	·6212	·3494	·0735	·7932	·5074	90
1	·8803	·6133	·3413	·0651	·7846	·4986	1
2	·8734	·6063	·3340	·0576	·7768	·4907	2
3	·8675	·6001	·3276	·0510	·7701	·4838	3
4	·8627	·5951	·3224	·0457	·7645	·4781	4
95	·8589	·5913	·3184	·0415	·7603	·4737	95
6	·8564	·5886	·3157	·0387	·7573	·4707	6

[145] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
55	18·6966	18·4635	18·2286	17·9926	17·7566	17·5210	55
6	·5971	·3594	·1196	·8782	·6367	·3952	6
7	·5019	·2598	·0152	·7688	·5218	·2747	7
8	·4110	·1645	17·9154	·6640	·4119	·1592	8
9	·3242	·0738	·8201	·5641	·3070	·0490	9
60	·2416	17·9872	·7295	·4689	·2069	16·9439	60
1	·1633	·9053	·6435	·3787	·1121	·8442	1
2	·0891	·8276	·5622	·2932	·0223	·7497	2
3	·0190	·7543	·4852	·2125	16·9375	·6605	3
4	17·9530	·6852	·4128	·1364	·8575	·5763	4
65	·8907	·6201	·3445	·0646	·7821	·4969	65
6	·8320	·5587	·2802	16·9971	·7110	·4222	6
7	·7768	·5009	·2196	·9335	·6442	·3518	7
8	·7247	·4465	·1625	·8736	·5812	·2855	8
9	·6757	·3952	·1089	·8173	·5220	·2231	9
70	·6298	·3474	·0587	·7646	·4666	·1649	70
1	·5873	·3030	·0123	·7158	·4153	·1109	1
2	·5481	·2621	16·9695	·6709	·3681	·0611	2
3	·5125	·2249	·9305	·6300	·3251	·0159	3
4	·4801	·1912	·8952	·5930	·2862	15·9749	4
75	·4508	·1606	·8633	·5595	·2509	·9378	75
6	·4238	·1325	·8339	·5286	·2185	·9037	6
7	·3991	·1068	·8070	·5004	·1889	·8724	7
8	·3764	·0831	·7822	·4744	·1616	·8437	8
9	·3555	·0613	·7595	·4506	·1365	·8174	9
80	·3365	·0416	·7389	·4290	·1138	·7934	80
1	·3195	·0239	·7204	·4096	·0935	·7720	1
2	·3043	·0081	·7039	·3924	·0754	·7529	2
3	·2907	16·9940	·6891	·3769	·0591	·7358	3
4	·2786	·9814	·6760	·3631	·0447	·7206	4
85	·2674	·9698	·6639	·3505	·0314	·7066	85
6	·2568	·9588	·6524	·3384	·0187	·6933	6
7	·2463	·9479	·6410	·3265	·0062	·6801	7
8	·2360	·9372	·6299	·3148	15·9939	·6672	8
9	·2257	·9265	·6188	·3032	·9816	·6543	9
90	·2156	·9161	·6080	·2918	·9697	·6417	90
1	·2066	·9068	·5983	·2817	·9591	·6305	1
2	·1985	·8985	·5896	·2727	·9496	·6205	2
3	·1914	·8912	·5821	·2648	·9414	·6118	3
4	·1856	·8853	·5760	·2585	·9347	·6047	4
95	·1811	·8807	·5713	·2536	·9296	·5993	95
6	·1780	·8775	·5681	·2503	·9261	·5956	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
55	17·2874	17·0561	16·8277	16·6019	16·3792	16·1595	55
6	·1555	16·9179	·6830	·4503	·2206	15·9936	6
7	·0290	·7853	·5438	·3046	·0679	·8337	7
8	16·9078	·6580	·4104	·1645	15·9211	·6798	8
9	·7919	·5364	·2827	·0305	·7804	·5322	9
60	·6815	·4203	·1607	15·9024	·6458	·3909	60
1	·5767	·3101	·0448	·7806	·5179	·2564	1
2	·4773	·2056	15·9349	·6650	·3963	·1285	2
3	·3834	·1068	·8310	·5556	·2811	·0073	3
4	·2948	·0135	·7328	·4522	·1723	14·8926	4
65	·2113	15·9256	·6402	·3547	·0695	·7843	65
6	·1325	·8427	·5529	·2627	14·9726	·6821	6
7	·0584	·7647	·4707	·1761	·8811	·5856	7
8	15·9886	·6911	·3932	·0943	·7950	·4946	8
9	·9229	·6219	·3203	·0175	·7139	·4090	9
70	·8615	·5573	·2521	14·9456	·6380	·3289	70
1	·8047	·4973	·1890	·8790	·5677	·2546	1
2	·7523	·4422	·1309	·8177	·5030	·1862	2
3	·7046	·3920	·0780	·7619	·4441	·1239	3
4	·6615	·3465	·0301	·7114	·3908	·0675	4
75	·6224	·3053	14·9867	·6656	·3425	·0164	75
6	·5864	·2675	·9468	·6236	·2981	13·9695	6
7	·5535	·2328	·9103	·5851	·2574	·9265	7
8	·5233	·2010	·8767	·5497	·2201	·8870	8
9	·4956	·1718	·8460	·5172	·1858	·8508	9
80	·4704	·1453	·8180	·4878	·1548	·8179	80
1	·4478	·1215	·7930	·4614	·1269	·7885	1
2	·4277	·1003	·7708	·4380	·1022	·7623	2
3	·4097	·0814	·7508	·4170	·0801	·7389	3
4	·3937	·0646	·7331	·3983	·0604	·7181	4
85	·3789	·0490	·7168	·3811	·0422	·6989	85
6	·3649	·0343	·7012	·3648	·0250	·6807	6
7	·3510	·0197	·6859	·3486	·0080	·6627	7
8	·3374	·0054	·6709	·3329	13·9914	·6452	8
9	·3238	14·9911	·6559	·3170	·9747	·6277	9
90	·3106	·9772	·6412	·3017	·9586	·6106	90
1	·2987	·9647	·6281	·2879	·9441	·5954	1
2	·2882	·9536	·6164	·2756	·9312	·5819	2
3	·2789	·9438	·6062	·2649	·9200	·5700	3
4	·2715	·9360	·5979	·2562	·9109	·5605	4
95	·2658	·9300	·5916	·2496	·9039	·5532	95
6	·2619	·9258	·5872	·2450	·8991	·5481	6

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.
3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
55	15·9429	15·7304	15·5225	———	8·6949	8·5149	55
6	·7695	·5493	·3336	15·1231	———	·3584	6
7	·6022	·3743	·1507	14·9322	14·7191	———	7
8	·4410	·2055	14·9742	·7477	·5265	14·3113	8
9	·2861	·0432	·8042	·5698	·3405	·1171	9
60	·1378	14·8875	·6409	·3987	·1615	13·9299	60
1	14·9964	·7390	·4849	·2351	13·9901	·7505	1
2	·8619	·5975	·3363	·0789	·8262	·5787	2
3	·7342	·4631	·1949	13·9303	·6700	·4147	3
4	·6135	·3359	·0609	·7892	·5216	·2588	4
65	·4993	·2154	13·9339	·6555	·3808	·1106	65
6	·3913	·1015	·8137	·5287	·2471	12·9698	6
7	·2895	13·9939	·7001	·4087	·1205	·8363	7
8	·1934	·8923	·5927	·2953	·0007	·7097	8
9	·1028	·7966	·4914	·1881	12·8874	·5900	9
70	·0181	·7069	·3965	·0876	·7810	·4775	70
1	13·9395	·6237	·3084	12·9943	·6821	·3728	1
2	·8671	·5470	·2271	·9081	·5908	·2760	2
3	·8011	·4771	·1530	·8295	·5074	·1876	3
4	·7414	·4138	·0858	·7582	·4318	·1073	4
75	·6873	·3564	·0249	·6936	·3631	·0344	75
6	·6375	·3036	12·9689	·6340	·2999	11·9672	6
7	·5920	·2553	·9176	·5795	·2419	·9055	7
8	·5502	·2109	·8704	·5293	·1885	·8488	8
9	·5118	·1702	·8271	·4833	·1396	·7966	9
80	·4770	·1332	·7878	·4415	·0951	·7492	80
1	·4457	·1000	·7525	·4040	·0551	·7067	1
2	·4180	·0706	·7212	·3706	·0196	·6688	2
3	·3932	·0442	·6932	·3408	11·9878	·6349	3
4	·3711	·0207	·6682	·3142	·9594	·6047	4
85	·3508	12·9991	·6452	·2897	·9333	·5768	85
6	·3315	·9786	·6233	·2663	·9084	·5502	6
7	·3124	·9584	·6018	·2434	·8839	·5240	7
8	·2939	·9386	·5809	·2210	·8600	·4985	8
9	·2753	·9189	·5598	·1986	·8360	·4728	9
90	·2573	·8998	·5395	·1769	·8129	·4481	90
1	·2411	·8827	·5213	·1575	·7922	·4260	1
2	·2268	·8674	·5051	·1403	·7738	·4063	2
3	·2143	·8542	·4910	·1253	·7578	·3891	3
4	·2042	·8435	·4796	·1131	·7448	·3753	4
95	·1965	·8353	·4710	·1039	·7350	·3648	95
6	·1912	·8297	·4650	·0975	·7282	·3576	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴹ.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
55	8·3274	8·1323	7·9310	7·7242	7·5127	7·2972	55
6	·1790	7·9920	·7986	·5996	·3958	·1879	6
7	·0233	·8445	·6593	·4683	·2724	·0723	7
8	———	·6898	·5129	·3301	·1423	6·9501	8
9	13·8998	———	·3590	·1847	·0051	·8210	9
60	·7043	13·4852	———	·0328	6·8616	·6857	60
1	·5167	·2891	13·0686	———	·7125	·5449	1
2	·3368	·1010	12·8721	12·6508	———	·3989	2
3	·1649	12·9210	·6839	·4543	12·2326	———	3
4	·0012	·7494	·5041	·2662	·0362	11·8145	4
65	12·8454	·5858	·3325	·0865	11·8483	·6182	65
6	·6972	·4299	·1688	11·9148	·6684	·4302	6
7	·5565	·2818	·0129	·7511	·4967	·2503	7
8	·4230	·1409	11·8647	·5951	·3328	·0784	8
9	·2965	·0074	·7238	·4468	·1768	10·9145	9
70	·1776	11·8817	·5911	·3068	·0293	·7593	70
1	·0667	·7645	·4671	·1759	10·8912	·6138	1
2	11·9642	·6559	·3523	·0545	·7630	·4786	2
3	·8705	·5566	·2471	10·9431	·6453	·3543	3
4	·7853	·4662	·1513	·8417	·5380	·2409	4
75	·7079	·3840	·0641	·7493	·4401	·1374	75
6	·6364	·3081	10·9835	·6637	·3495	·0414	6
7	·5708	·2384	·9093	·5850	·2659	9·9528	7
8	·5105	·1741	·8410	·5123	·1888	·8710	8
9	·4550	·1150	·7780	·4454	·1176	·7954	9
80	·4044	·0612	·7207	·3843	·0526	·7264	80
1	·3591	·0128	·6691	·3293	9·9941	·6641	1
2	·3187	10·9698	·6232	·2804	·9420	·6087	2
3	·2826	·9312	·5821	·2365	·8952	·5589	3
4	·2503	·8967	·5453	·1973	·8534	·5143	4
85	·2205	·8649	·5113	·1611	·8148	·4732	85
6	·1921	·8345	·4789	·1264	·7778	·4338	6
7	·1641	·8046	·4468	·0922	·7413	·3948	7
8	·1368	·7753	·4155	·0587	·7054	·3565	8
9	·1093	·7459	·3839	·0248	·6692	·3178	9
90	·0828	·7174	·3534	9·9920	·6341	·2802	90
1	·0591	·6919	·3260	·9626	·6024	·2463	1
2	·0380	·6693	·3016	·9364	·5743	·2161	2
3	·0197	·6495	·2803	·9134	·5495	·1895	3
4	·0048	·6336	·2632	·8949	·5296	·1680	4
95	10·9936	·6215	·2501	·8809	·5144	·1517	95
6	·9858	·6132	·2412	·8712	·5040	·1404	6

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
55	7·0787	6·8562	6·6292	6·3969	6·1587	5·9130	55
6	6·9767	·7613	·5412	·3155	·0837	·8441	6
7	·8686	·6606	·4476	·2288	·0038	·7706	7
8	·7542	·5538	·3482	·1366	5·9185	·6921	8
9	·6330	·4404	·2425	·0383	·8276	·6082	9
60	·5059	·3213	·1312	5·9348	·7314	·5194	60
1	·3734	·1969	·0148	·8262	·6306	·4260	1
2	·2357	·0674	5·8935	·7129	·5252	·3283	2
3	·0933	5·9334	·7676	·5952	·4155	·2265	3
4	——	·7952	·6377	·4735	·3019	·1210	4
65	11·3968	——	·5028	·3470	·1836	·0109	65
6	·2005	10·9792	——	·2147	·0597	4·8954	6
7	·0124	·7827	10·5612	——	4·9292	·7734	7
8	10·8324	·5945	·3646	10·1428	——	·6441	8
9	·6604	·4143	·1760	9·9457	9·7234	——	9
70	·4974	·2432	9·9968	·7581	·5272	9·3040	70
1	·3443	·0824	·8280	·5811	·3418	·1101	1
2	·2019	9·9326	·6705	·4157	·1683	8·9283	2
3	·0708	·7945	·5252	·2629	·0078	·7597	3
4	9·9511	·6682	·3921	·1228	8·8603	·6047	4
75	·8417	·5527	·2703	8·9943	·7250	·4623	75
6	·7402	·4454	·1569	·8746	·5987	·3290	6
7	·6464	·3462	·0520	·7637	·4815	·2052	7
8	·5597	·2544	8·9548	·6608	·3726	·0900	8
9	·4796	·1694	·8647	·5654	·2715	7·9828	9
80	·4062	·0916	·7823	·4779	·1786	·8842	80
1	·3401	·0214	·7077	·3988	·0946	·7949	1
2	·2812	8·9588	·6412	·3280	·0194	·7150	2
3	·2282	·9025	·5812	·2643	7·9516	·6428	3
4	·1808	·8520	·5275	·2072	·8908	·5779	4
85	·1369	·8053	·4778	·1541	·8342	·5175	85
6	·0949	·7605	·4300	·1031	·7797	·4593	6
7	·0534	·7162	·3828	·0526	·7257	·4013	7
8	·0126	·6728	·3364	·0030	·6724	·3442	8
9	8·9713	·6287	·2893	7·9526	·6184	·2860	9
90	·9312	·5859	·2436	·9037	·5659	·2293	90
1	·8949	·5472	·2023	·8596	·5185	·1781	1
2	·8626	·5127	·1655	·8202	·4762	·1324	2
3	·8341	·4822	·1329	·7854	·4389	·0922	3
4	·8110	·4575	·1065	·7572	·4087	·0596	4
95	·7935	·4387	·0864	·7357	·3857	·0348	95
6	·7813	·4256	·0724	·7207	·3697	·0175	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
55	5·6627	5·4104	5·1605	4·9169	4·6838	4·4616	55
6	·5997	·3530	·1082	·8694	·6406	·4225	6
7	·5323	·2914	·0521	·8183	·5942	·3803	7
8	·4602	·2255	4·9919	·7634	·5442	·3348	8
9	·3831	·1547	·9272	·7043	·4903	·2857	9
60	·3013	·0797	·8584	·6414	·4328	·2332	60
1	·2152	·0005	·7858	·5750	·3720	·1776	1
2	·1250	4·9175	·7096	·5051	·3080	·1191	2
3	·0309	·8308	·6299	·4320	·2410	·0577	3
4	4·9332	·7407	·5470	·3559	·1712	3·9938	4
65	·8312	·6464	·4601	·2760	·0979	·9266	65
6	·7238	·5470	·3684	·1915	·0202	·8552	6
7	·6102	·4416	·2709	·1015	3·9372	·7789	7
8	·4895	·3293	·1667	·0050	·8481	·6966	8
9	·3598	·2081	·0538	3·9002	·7508	·6064	9
70	——	·0796	3·9338	·7882	·6466	·5095	70
1	8·8878	——	·8079	·6705	·5366	·4069	1
2	·6975	8·4778	——	·5494	·4232	·3009	2
3	·5209	·2930	8·0780	——	·3091	·1940	3
4	·3581	·1225	7·8998	7·6917	——	·0893	4
75	·2084	7·9654	·7353	·5200	7·3203	——	75
6	·0680	·8178	·5807	·3584	·1519	6·9602	6
7	7·9373	·6802	·4361	·2070	6·9940	·7959	7
8	·8156	·5517	·3009	·0652	·8457	·6415	8
9	·7021	·4318	·1744	6·9323	·7066	·4962	9
80	·5975	·3211	·0575	·8092	·5775	·3614	80
1	·5027	·2204	6·9510	·6969	·4596	·2381	1
2	·4177	·1302	·8554	·5961	·3536	·1270	2
3	·3409	·0485	·7689	·5046	·2574	·0261	3
4	·2717	6·9750	·6908	·4220	·1704	5·9349	4
85	·2073	·9064	·6179	·3449	·0890	·8494	85
6	·1450	·8399	·5471	·2698	·0097	·7659	6
7	·0829	·7734	·4762	·1944	5·9299	·6817	7
8	·0215	·7075	·4056	·1191	·8500	·5972	8
9	6·9587	·6399	·3330	·0413	·7672	·5094	9
90	·8975	·5737	·2615	5·9646	·6852	·4222	90
1	·8420	·5134	·1963	·8943	·6098	·3419	1
2	·7924	·4595	·1377	·8308	·5417	·2692	2
3	·7487	·4117	·0855	·7741	·4805	·2037	3
4	·7133	·3730	·0431	·7278	·4303	·1498	4
95	·6863	·3435	·0107	·6922	·3916	·1082	95
6	·6676	·3230	5·9881	·6673	·3644	·0789	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
55	4·2418	4·0261	3·8136	3·6021	3·3947	3·1964	55
6	·2063	3·9941	·7848	·5762	·3715	·1757	6
7	·1681	·9596	·7536	·5483	·3465	·1532	7
8	·1269	·9223	·7199	·5179	·3193	·1288	8
9	·0822	·8817	·6833	·4849	·2895	·1021	9
60	·0344	·8384	·6440	·4495	·2576	·0734	60
1	3·9838	·7923	·6023	·4117	·2236	·0428	1
2	·9303	·7437	·5581	·3718	·1876	·0103	2
3	·8743	·6927	·5118	·3299	·1497	2·9762	3
4	·8159	·6395	·4635	·2861	·1103	·9406	4
65	·7545	·5835	·4126	·2401	·0687	·9031	65
6	·6892	·5239	·3584	·1910	·0242	·8630	6
7	·6192	·4599	·3001	·1380	2·9763	·8196	7
8	·5435	·3905	·2367	·0803	·9240	·7722	8
9	·4603	·3139	·1664	·0161	·8655	·7190	9
70	·3705	·2310	·0900	2·9460	·8014	·6604	70
1	·2751	·1425	·0083	·8707	·7322	·5971	1
2	·1761	·0505	2·9230	·7920	·6597	·5304	2
3	·0762	2·9574	·8365	·7119	·5858	·4623	3
4	2·9783	·8660	·7516	·6332	·5131	·3952	4
75	·8832	·7773	·6690	·5568	·4424	·3299	75
6	———	·6857	·5837	·4775	·3690	·2620	6
7	6·6081	———	·4966	·3964	·2938	·1923	7
8	·4474	6·2643	———	·3127	·2160	·1200	8
9	·2961	·1070	5·9280	———	·1339	·0435	9
80	·1554	5·9604	·7755	5·6001	———	1·9639	80
1	·0266	·8261	·6357	·4547	5·2851	———	1
2	5·9105	·7049	·5094	·3233	·1486	4·9874	2
3	·8049	·5946	·3945	·2036	·0241	·8585	3
4	·7093	·4948	·2903	·0951	4·9113	·7415	4
85	·6197	·4010	·1923	4·9929	·8051	·6314	85
6	·5319	·3089	·0959	·8923	·7002	·5225	6
7	·4432	·2156	4·9979	·7896	·5929	·4108	7
8	·3539	·1214	·8988	·6854	·4836	·2967	8
9	·2608	·0229	·7946	·5753	·3676	·1749	9
90	·1683	4·9246	·6904	·4647	·2504	·0513	90
1	·0828	·8337	·5936	·3616	·1408	3·9351	1
2	·0051	·7509	·5052	·2671	·0398	·8276	2
3	4·9351	·6761	·4252	·1813	3·9477	·7289	3
4	·8773	·6142	·3590	·1101	·8709	·6462	4
95	·8326	·5662	·3076	·0547	·8109	·5813	95
6	·8009	·5322	·2710	·0153	·7682	·5348	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴍ.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
55	3·0129	2·8420	2·6876	2·5429	2·3979	2·2431	55
6	2·9943	·8254	·6728	·5297	·3862	·2330	6
7	·9742	·8074	·6566	·5153	·3735	·2220	7
8	·9523	·7877	·6390	·4996	·3596	·2099	8
9	·9282	·7661	·6196	·4822	·3442	·1964	9
60	·9024	·7428	·5986	·4634	·3274	·1818	60
1	·8748	·7180	·5762	·4432	·3095	·1660	1
2	·8455	·6916	·5524	·4218	·2904	·1492	2
3	·8147	·6638	·5274	·3993	·2703	·1316	3
4	·7826	·6349	·5013	·3760	·2496	·1134	4
65	·7488	·6044	·4739	·3514	·2278	·0944	65
6	·7126	·5719	·4446	·3251	·2045	·0740	6
7	·6735	·5365	·4126	·2965	·1791	·0519	7
8	·6305	·4976	·3774	·2648	·1509	·0272	8
9	·5820	·4535	·3374	·2286	·1184	1·9987	9
70	·5285	·4046	·2928	·1880	·0819	·9663	70
1	·4704	·3514	·2439	·1433	·0414	·9302	1
2	·4091	·2949	·1920	·0957	1·9981	·8913	2
3	·3462	·2370	·1386	·0465	·9532	·8509	3
4	·2843	·1798	·0858	1·9980	·9089	·8110	4
75	·2241	·1243	·0345	·9508	·8659	·7724	75
6	·1612	·0661	1·9807	·9011	·8205	·7315	6
7	·0966	·0062	·9250	·8496	·7733	·6889	7
8	·0294	1·9436	·8668	·7956	·7236	·6439	8
9	1·9580	·8770	·8045	·7375	·6697	·5947	9
80	·8835	·8073	·7391	·6761	·6126	·5422	80
1	·8089	·7371	·6731	·6140	·5545	·4885	1
2	——	·6704	·6102	·5548	·4990	·4370	2
3	4·7083	——	·5503	·4983	·4460	·3877	3
4	·5875	4·4467	——	·4482	·3991	·3443	4
85	·4737	·3295	4·1986	——	·3565	·3051	85
6	·3611	·2134	·0793	3·9527	——	·2662	6
7	·2454	·0940	3·9564	·8264	3·6969	——	7
8	·1268	3·9713	·8300	·6963	·5630	3·4245	8
9	3·9998	·8393	·6936	·5557	·4179	·2743	9
90	·8702	·7042	·5536	·4111	·2685	·1194	90
1	·7477	·5761	·4205	·2734	·1261	2·9715	1
2	·6340	·4565	·2958	·1441	2·9923	·8325	2
3	·5289	·3453	·1793	·0231	·8668	·7021	3
4	·4403	·2511	·0802	2·9197	·7593	·5902	4
95	·3705	·1763	·0011	·8368	·6729	·5002	95
6	·3202	·1221	2·9434	·7762	·6095	·4339	6

Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

Hm.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
55	2·0785	1·8818	1·6568	1·4235	1·1823	0·9197	55
6	·0699	·8748	·6512	·4192	·1792	·9176	6
7	·0605	·8671	·6451	·4145	·1758	·9154	7
8	·0502	·8586	·6384	·4094	·1721	·9128	8
9	·0387	·8490	·6308	·4036	·1678	·9100	9
60	·0261	·8386	·6224	·3971	·1631	·9068	60
1	·0125	·8273	·6134	·3901	·1579	·9033	1
2	1·9981	·8152	·6036	·3826	·1523	·8995	2
3	·9829	·8025	·5934	·3746	·1464	·8954	3
4	·9672	·7894	·5828	·3664	·1403	·8912	4
65	·9508	·7758	·5719	·3579	·1340	·8869	65
6	·9334	·7614	·5604	·3490	·1274	·8824	6
7	·9145	·7458	·5480	·3394	·1204	·8776	7
8	·8935	·7284	·5342	·3289	·1128	·8725	8
9	·8688	·7079	·5179	·3164	·1037	·8663	9
70	·8407	·6844	·4989	·3017	·0929	·8590	70
1	·8091	·6576	·4771	·2847	·0802	·8504	1
2	·7749	·6284	·4532	·2657	·0659	·8405	2
3	·7392	·5979	·4279	·2455	·0506	·8297	3
4	·7039	·5676	·4029	·2256	·0353	·8189	4
75	·6699	·5386	·3791	·2067	·0210	·8089	75
6	·6338	·5078	·3536	·1864	·0057	·7981	6
7	·5961	·4755	·3271	·1653	0·9897	·7869	7
8	·5560	·4411	·2986	·1427	·9727	·7751	8
9	·5119	·4029	·2668	·1172	·9533	·7615	9
80	·4645	·3614	·2319	·0888	·9314	·7459	80
1	·4156	·3183	·1952	·0587	·9078	·7289	1
2	·3686	·2765	·1594	·0292	·8845	·7120	2
3	·3234	·2363	·1247	·0001	·8613	·6949	3
4	·2837	·2010	·0943	0·9747	·8410	·6799	4
85	·2482	·1697	·0676	·9526	·8235	·6669	85
6	·2131	·1391	·0418	·9315	·8069	·6548	6
7	·1739	·1050	·0132	·9084	·7890	·6418	7
8	—	·0676	0·9824	·8840	·7709	·6296	8
9	3·1247	—	·9356	·8461	·7417	·6090	9
90	2·9632	2·7909	—	·7908	·6979	·5770	90
1	·8089	·6277	2·4363	—	·6448	·5379	1
2	·6636	·4737	·2708	2·0712	—	·4898	2
3	·5273	·3288	·1141	1·9005	1·6902	—	3
4	·4107	·2045	1·9791	·7525	·5260	1·2971	4
95	·3171	·1048	·8701	·6322	·3916	·1424	95
6	·2483	·0317	·7897	·5429	·2914	·0253	6

[154] Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

3 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
55	0·6577	0·4051	0·1746	55
6	·6564	·4044	·1743	6
7	·6550	·4037	·1740	7
8	·6535	·4029	·1738	8
9	·6517	·4020	·1734	9
60	·6497	·4010	·1730	60
1	·6476	·3998	·1726	1
2	·6452	·3986	·1721	2
3	·6427	·3972	·1716	3
4	·6401	·3958	·1711	4
65	·6374	·3944	·1706	65
6	·6346	·3929	·1700	6
7	·6316	·3913	·1694	7
8	·6285	·3897	·1688	8
9	·6247	·3877	·1681	9
70	·6202	·3854	·1672	70
1	·6149	·3826	·1662	1
2	·6087	·3793	·1650	2
3	·6018	·3756	·1636	3
4	·5949	·3718	·1621	4
75	·5886	·3684	·1608	75
6	·5817	·3646	·1594	6
7	·5746	·3608	·1579	7
8	·5671	·3567	·1564	8
9	·5585	·3521	·1546	9
80	·5485	·3467	·1525	80
1	·5374	·3405	·1501	1
2	·5264	·3344	·1478	2
3	·5149	·3279	·1452	3
4	·5048	·3221	·1429	4
85	·4961	·3172	·1409	85
6	·4881	·3127	·1392	6
7	·4795	·3077	·1371	7
8	·4720	·3038	·1357	8
9	·4591	·2970	·1332	9
90	·4378	·2850	·1285	90
1	·4117	·2702	·1226	1
2	·3798	·2524	·1157	2
3	·3311	·2240	·1042	3
4	——	·1849	·0879	4
95	0·9073	——	·0647	95
6	·7674	0·5288	——	6

[155] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

TWO LIVES.

Hm.

THREE AND A HALF PER-CENT.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives. Equal Ages.

x	$a_{x.x}$	$2a_x - a_{x.x}$	x	$a_{x.x}$	$2a_x - a_{x.x}$
10	19·3289	24·5789	55	8·5546	14·5124
1	·2029	·4655	6	·2385	·1805
2	·0346	·3432	7	7·9231	13·8135
3	18·8322	·2134	8	·6085	·4417
4	·6054	·0770	9	·2944	·0656
15	·3635	23·9351	60	6·9834	12·6860
6	·1158	·7894	1	·6767	·3037
7	17·8722	·6410	2	·3754	11·9196
8	·6423	·4913	3	·0805	·5341
9	·4360	·3422	4	5·7931	·1483
20	·2554	·1938	65	·5115	10·7611
1	·0876	·0440	6	·2342	·3726
2	16·9259	22·8915	7	4·9595	9·9827
3	·7606	·7344	8	·6863	·5909
4	·5843	·5715	9	·4111	·1965
25	·3949	·4023	70	·1378	8·8028
6	·1960	·2270	1	3·8695	·4123
7	15·9893	·0461	2	·6111	·0287
8	·7798	21·8606	3	·3676	7·6556
9	·5689	·6703	4	·1437	·2961
30	·3561	·4751	75	2·9395	6·9499
1	·1419	·2751	6	·7424	·6098
2	14·9231	·0693	7	·5543	·2773
3	·6988	20·8578	8	·3730	5·9518
4	·4685	·6399	9	·1949	·6321
35	·2329	·4161	80	·0225	·3219
6	13·9930	·1860	1	1·8612	·0258
7	·7502	19·9504	2	·7174	4·7486
8	·5047	·7085	3	·5886	·4876
9	·2549	·4603	4	·4806	·2438
40	12·9996	·2056	85	·3877	·0079
1	·7363	18·9431	6	·3007	3·7671
2	·4629	·6729	7	·2107	·5109
3	·1805	·3947	8	·1202	·2366
4	11·8921	·1093	9	·0036	2·9242
45	·5979	17·8165	90	0·8625	·5809
6	·3019	·5177	1	·7193	·2269
7	·0062	·2132	2	·5762	1·8608
8	10·7102	16·9026	3	·4173	·4709
9	·4122	·5858	4	·2654	·0798
50	·1123	·2625	95	·1314	0·6944
1	9·8082	15·9322	6	·0326	·3224
2	·4986	·5914			
3	·1854	·2498			
4	8·8707	14·8991			

Hᴍ.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
10	———	19·2650	19·1783	19·0722	18·9516	18·8209	10
1	24·5231	———	·1178	·0136	·8949	·7661	1
2	·4645	24·4053	———	18·9323	·8157	·6890	2
3	·4045	·3434	24·2794	———	·7177	·5932	3
4	·3435	·2805	·2144	24·1463	———	·4833	4
15	·2823	·2174	·1492	·0789	24·0072	———	15
6	·2216	·1549	·0847	·0120	23·9379	23·8635	6
7	·1620	·0934	·0212	23·9463	·8699	·7930	7
8	·1039	·0336	23·9593	·8823	·8036	·7242	8
9	·0481	23·9759	·8997	·8206	·7397	·6580	9
20	23·9943	·9204	·8422	·7611	·6780	·5941	20
1	·9418	·8662	·7862	·7030	·6178	·5317	1
2	·8901	·8129	·7310	·6458	·5585	·4702	2
3	·8387	·7598	·6761	·5890	·4995	·4089	3
4	·7874	·7067	·6211	·5319	·4404	·3476	4
25	·7357	·6536	·5661	·4748	·3811	·2862	25
6	·6842	·6003	·5111	·4178	·3218	·2246	6
7	·6331	·5474	·4562	·3611	·2629	·1633	7
8	·5823	·4953	·4022	·3049	·2047	·1028	8
9	·5321	·4435	·3489	·2495	·1471	·0430	9
30	·4826	·3924	·2959	·1949	·0902	22·9838	30
1	·4337	·3420	·2438	·1406	·0342	·9255	1
2	·3852	·2921	·1922	·0871	22·9784	·8678	2
3	·3372	·2426	·1410	·0342	·9234	·8105	3
4	·2895	·1935	·0903	22·9815	·8688	·7537	4
35	·2424	·1451	·0403	·9296	·8149	·6976	35
6	·1957	·0970	22·9907	·8782	·7614	·6421	6
7	·1498	·0499	·9418	·8277	·7089	·5875	7
8	·1044	·0032	·8936	·7776	·6570	·5335	8
9	·0597	22·9571	·8461	·7284	·6059	·4804	9
40	·0155	·9118	·7992	·6798	·5554	·4279	40
1	22·9718	·8669	·7529	·6317	·5055	·3759	1
2	·9285	·8226	·7071	·5843	·4561	·3247	2
3	·8859	·7787	·6619	·5374	·4074	·2739	3
4	·8439	·7356	·6173	·4913	·3594	·2240	4
45	·8025	·6933	·5737	·4458	·3123	·1749	45
6	·7621	·6518	·5309	·4016	·2661	·1269	6
7	·7227	·6114	·4892	·3583	·2212	·0800	7
8	·6843	·5720	·4485	·3160	·1772	·0343	8
9	·6467	·5336	·4087	·2749	·1343	21·9895	9
50	·6101	·4961	·3701	·2346	·0924	·9459	50
1	·5744	·4596	·3323	·1955	·0516	·9033	1
2	·5397	·4239	·2955	·1572	·0117	·8616	2
3	·5058	·3892	·2597	·1200	21·9728	·8210	3
4	·4731	·3557	·2250	·0839	·9352	·7816	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^{M}.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
10	18·6849	18·5485	18·4168	18·2949	18·1842	18·0779	10
1	·6319	·4974	·3674	·2474	·1384	·0338	1
2	·5568	·4243	·2964	·1783	·0713	17·9685	2
3	·4634	·3331	·2073	·0913	17·9863	·8856	3
4	·3559	·2279	·1044	17·9906	·8878	·7892	4
15	·2384	·1129	17·9919	·8804	·7798	·6834	15
6	———	17·9927	·8742	·7651	·6668	·5726	6
7	23·7165	———	·7560	·6494	·5534	·4615	7
8	·6452	23·5674	———	·5379	·4443	·3547	8
9	·5766	·4963	23·4180	———	·3445	·2573	9
20	·5104	·4278	·3471	23·2692	———	·1703	20
1	·4458	·3609	·2779	·1976	23·1201	———	1
2	·3820	·2949	·2095	·1270	·0472	22·9689	2
3	·3185	·2290	·1414	·0566	22·9744	·8939	3
4	·2548	·1630	·0730	22·9859	·9014	·8185	4
25	·1910	·0967	·0044	·9148	·8280	·7427	25
6	·1272	·0306	22·9357	·8437	·7546	·6668	6
7	·0635	22·9646	·8673	·7728	·6813	·5912	7
8	·0006	·8992	·7996	·7028	·6088	·5163	8
9	22·9384	·8346	·7326	·6335	·5372	·4421	9
30	·8770	·7708	·6664	·5649	·4663	·3689	30
1	·8163	·7078	·6010	·4972	·3962	·2965	1
2	·7563	·6453	·5363	·4300	·3268	·2247	2
3	·6969	·5837	·4722	·3638	·2581	·1538	3
4	·6377	·5224	·4086	·2978	·1901	·0833	4
35	·5795	·4618	·3459	·2328	·1228	·0139	35
6	·5218	·4019	·2836	·1685	·0563	21·9451	6
7	·4650	·3429	·2225	·1051	21·9909	·8776	7
8	·4089	·2846	·1621	·0426	·9262	·8109	8
9	·3536	·2272	·1025	21·9810	·8626	·7452	9
40	·2991	·1706	·0438	·9202	·7998	·6804	40
1	·2451	·1145	21·9856	·8600	·7377	·6163	1
2	·1917	·0590	·9281	·8005	·6764	·5530	2
3	·1389	·0041	·8712	·7418	·6157	·4906	3
4	·0870	21·9502	·8152	·6839	·5561	·4291	4
45	·0359	·8971	·7602	·6270	·4974	·3688	45
6	21·9859	·8451	·7063	·5713	·4401	·3097	6
7	·9372	·7944	·6538	·5170	·3841	·2522	7
8	·8894	·7449	·6024	·4640	·3295	·1960	8
9	·8429	·6963	·5522	·4121	·2761	·1411	9
50	·7974	·6491	·5030	·3614	·2240	·0876	50
1	·7529	·6029	·4551	·3118	·1730	·0353	1
2	·7095	·5576	·4082	·2634	·1231	20·9841	2
3	·6671	·5135	·3624	·2161	·0746	·9342	3
4	·6260	·4706	·3180	·1602	·0274	·8859	4

Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
10	17·9725	17·8627	17·7444	17·6168	17·4812	17·3385	10
1	·9300	·8219	·7054	·5792	·4454	·3045	1
2	·8666	·7603	·6457	·5214	·3893	·2504	2
3	·7857	·6813	·5688	·4466	·3165	·1794	3
4	·6914	·5892	·4787	·3587	·2309	·0960	4
15	·5878	·4879	·3796	·2617	·1362	·0037	15
6	·4793	·3816	·2757	·1602	·0369	16·9068	6
7	·3704	·2751	·1715	·0585	16·9375	·8097	7
8	·2660	·1729	·0717	16·9610	·8426	·7172	8
9	·1708	·0800	16·9811	·8729	·7569	·6340	9
20	·0861	16·9977	·9011	·7952	·6815	·5610	20
1	·0056	·9194	·8252	·7217	·6105	·4923	1
2		·8420	·7502	·6492	·5404	·4247	2
3	22·8142		·6712	·5727	·4665	·3533	3
4	·7364	22·6542		·4883	·3847	·2743	4
25	·6581	·5734	22·4882		·2940	·1864	25
6	·5798	·4925	·4047	22·3161		·0912	6
7	·5017	·4119	·3213	·2299	22·1380		7
8	·4243	·3320	·2387	·1444	·0497	21·9549	8
9	·3477	·2528	·1569	·0598	21·9621	·8643	9
30	·2719	·1744	·0758	21·9760	·8754	·7746	30
1	·1972	·0971	21·9958	·8932	·7897	·6858	1
2	·1231	·0205	·9165	·8110	·7045	·5976	2
3	·0497	21·9447	·8380	·7297	·6203	·5103	3
4	21·9769	·8694	·7601	·6490	·5367	·4236	4
35	·9051	·7951	·6833	·5694	·4542	·3380	35
6	·8341	·7217	·6072	·4906	·3725	·2534	6
7	·7642	·6495	·5325	·4132	·2922	·1700	7
8	·6953	·5782	·4588	·3369	·2129	·0879	8
9	·6276	·5082	·3863	·2617	·1351	·0069	9
40	·5607	·4392	·3149	·1877	·0584	20·9274	40
1	·4946	·3710	·2444	·1147	20·9826	·8488	1
2	·4294	·3036	·1748	·0427	·9080	·7712	2
3	·3650	·2372	·1061	20·9716	·8344	·6949	3
4	·3017	·1719	·0387	·9018	·7621	·6200	4
45	·2396	·1079	20·9726	·8335	·6912	·5465	45
6	·1788	·0453	·9080	·7667	·6221	·4748	6
7	·1196	20·9844	·8452	·7016	·5548	·4051	7
8	·0619	·9249	·7839	·6384	·4892	·3372	8
9	·0055	·8669	·7241	·5766	·4254	·2709	9
50	20·9504	·8104	·6658	·5165	·3632	·2066	50
1	·8968	·7552	·6090	·4578	·3025	·1438	1
2	·8443	·7013	·5535	·4006	·2434	·0827	2
3	·7932	·6489	·4996	·3450	·1859	·0232	3
4	·7436	·5980	·4473	·2910	·1302	19·9656	4

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
10	17·1918	17·0414	16·8869	16·7287	16·5649	16·3950	10
1	·1591	·0103	·8574	·7007	·5383	·3699	1
2	·1069	16·9596	·8086	·6536	·4929	·3262	2
3	·0381	·8929	·7435	·5907	·4319	·2669	3
4	16·9567	·8137	·6666	·5155	·3590	·1961	4
15	·8667	·7259	·5811	·4323	·2777	·1171	15
6	·7722	·6338	·4912	·3448	·1925	·0340	6
7	·6776	·5416	·4014	·2573	·1075	15·9512	7
8	·5874	·4538	·3160	·1743	·0267	·8729	8
9	·5065	·3752	·2398	·1004	15·9553	·8036	9
20	·4360	·3070	·1739	·0369	·8940	·7448	20
1	·3697	·2433	·1125	15·9778	·8373	·6903	1
2	·3046	·1806	·0524	·9200	·7818	·6373	2
3	·2357	·1143	15·9887	·8589	·7232	·5811	3
4	·1594	·0406	·9177	·7906	·6576	·5182	4
25	·0744	15·9584	·8382	·7139	·5838	·4472	25
6	15·9820	·8690	·7517	·6303	·5032	·3695	6
7	·8830	·7730	·6587	·5404	·4163	·2857	7
8	———	·6728	·5617	·4465	·3254	·1980	8
9	21·7670	———	·4609	·3489	·2311	·1070	9
30	·6741	21·5743	———	·2473	·1328	·0120	30
1	·5822	·4792	21·3768	———	·0307	14·9133	1
2	·4910	·3847	·2790	21·1740	———	·8091	2
3	·4005	·2909	·1819	·0735	20·9654	———	3
4	·3106	·1978	·0854	20·9735	·8619	20·7507	4
35	·2218	·1057	20·9900	·8746	·7594	·6446	35
6	·1340	·0146	·8954	·7769	·6578	·5392	6
7	·0476	20·9250	·8024	·6800	·5576	·4353	7
8	20·9623	·8365	·7106	·5847	·4586	·3326	8
9	·8784	·7494	·6201	·4909	·3611	·2313	9
40	·7957	·6635	·5310	·3983	·2651	·1315	40
1	·7141	·5788	·4430	·3069	·1701	·0328	1
2	·6337	·4953	·3562	·2167	·0764	19·9354	2
3	·5543	·4129	·2707	·1278	19·9840	·8393	3
4	·4766	·3322	·1868	·0407	·8934	·7451	4
45	·4004	·2531	·1046	19·9553	·8046	·6527	45
6	·3260	·1759	·0245	·8720	·7180	·5627	6
7	·2537	·1008	19·9466	·7911	·6339	·4751	7
8	·1833	·0278	·8707	·7123	·5520	·3899	8
9	·1146	19·9566	·7969	·6356	·4723	·3070	9
50	·0479	·8874	·7251	·5611	·3949	·2265	50
1	19·9829	·8200	·6552	·4886	·3195	·1481	1
2	·9196	·7544	·5871	·4180	·2462	·0719	2
3	·8580	·6907	·5211	·3494	·1750	18·9979	3
4	·7984	·6290	·4572	·2832	·1062	·9264	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
10	16·2186	16·0360	15·8477	15·6544	15·4561	15·2518	10
1	·1949	·0136	·8267	·6346	·4376	·2347	1
2	·1528	15·9731	·7877	·5974	·4019	·2004	2
3	·0955	·9177	·7341	·5454	·3518	·1520	3
4	·0266	·8508	·6693	·4826	·2908	·0929	4
15	15·9498	·7762	·5967	·4121	·2224	·0265	15
6	·8691	·6976	·5203	·3379	·1503	14·9566	6
7	·7884	·6193	·4442	·2640	·0786	·8870	7
8	·7124	·5454	·3727	·1946	·0113	·8219	8
9	·6455	·4808	·3101	·1343	14·9531	·7657	9
20	·5887	·4263	·2578	·0840	·9050	·7196	20
1	·5367	·3764	·2102	·0385	·8615	·6782	1
2	·4860	·3281	·1641	14·9948	·8200	·6387	2
3	·4323	·2769	·1153	·9483	·7759	·5969	3
4	·3720	·2191	·0602	·8957	·7257	·5492	4
25	·3038	·1537	14·9975	·8357	·6683	·4945	25
6	·2290	·0818	·9285	·7696	·6052	·4340	6
7	·1483	·0042	·8538	·6980	·5364	·3684	7
8	·0638	14·9229	·7757	·6229	·4645	·2994	8
9	14·9760	·8384	·6945	·5449	·3897	·2278	9
30	·8844	·7501	·6097	·4635	·3116	·1531	30
1	·7892	·6584	·5211	·3788	·2304	·0752	1
2	·6885	·5613	·4279	·2889	·1442	13·9927	2
3	·5818	·4582	·3286	·1933	·0523	·9046	3
4	———	·3487	·2229	·0915	13·9543	·8104	4
35	20·5300	———	·1109	13·9834	·8503	·7104	35
6	·4208	20·3031	———	·8695	·7404	·6048	6
7	·3130	·1914	20·0703	———	·6253	·4939	7
8	·2065	·0808	19·9557	19·8316	———	·3775	8
9	·1014	19·9717	·8423	·7140	19·5867	———	9
40	19·9975	·8639	·7304	·5978	·4660	19·3353	40
1	·8949	·7572	·6196	·4827	·3464	·2111	1
2	·7937	·6518	·5099	·3688	·2280	·0881	2
3	·6938	·5479	·4018	·2562	·1110	18·9665	3
4	·5957	·4458	·2956	·1456	18·9959	·8467	4
45	·4996	·3458	·1914	·0371	·8829	·7290	45
6	·4058	·2481	·0897	18·9312	·7725	·6140	6
7	·3147	·1531	18·9907	·8280	·6650	·5019	7
8	·2259	·0607	·8944	·7276	·5603	·3928	8
9	·1397	18·9708	·8006	·6298	·4583	·2864	9
50	·0558	·8834	·7095	·5348	·3592	·1829	50
1	18·9742	·7984	·6209	·4423	·2627	·0822	1
2	·8949	·7158	·5347	·3525	·1689	17·9842	2
3	·8179	·6356	·4512	·2653	·0780	·8892	3
4	·7436	·5582	·3704	·1812	17·9901	·7974	4

[192] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
10	15·0410	14·8218	14·5933	14·3556	14·1107	13·8586	10
1	·0250	·8070	·5795	·3431	·0993	·8481	1
2	14·9923	·7757	·5497	·3146	·0723	·8224	2
3	·9456	·7308	·5064	·2730	·0322	·7842	3
4	·8884	·6754	·4530	·2214	13·9825	·7361	4
15	·8240	·6131	·3925	·1630	·9260	·6816	15
6	·7561	·5472	·3288	·1013	·8663	·6239	6
7	·6886	·4818	·2655	·0401	·8071	·5667	7
8	·6256	·4209	·2066	13·9832	·7523	·5138	8
9	·5715	·3688	·1565	·9349	·7059	·4693	9
20	·5274	·3266	·1161	·8965	·6692	·4344	20
1	·4880	·2892	·0807	·8628	·6374	·4042	1
2	·4506	·2538	·0472	·8313	·6077	·3763	2
3	·4109	·2162	·0118	·7979	·5763	·3468	3
4	·3656	·1732	13·9710	·7594	·5399	·3125	4
25	·3135	·1236	·9238	·7146	·4975	·2723	25
6	·2557	·0686	·8714	·6647	·4501	·2275	6
7	·1929	·0086	·8144	·6104	·3984	·1784	7
8	·1271	13·9458	·7544	·5535	·3443	·1270	8
9	·0587	·8805	·6922	·4943	·2881	·0737	9
30	13·9872	·8123	·6273	·4325	·2295	·0182	30
1	·9128	·7413	·5597	·3683	·1685	12·9604	1
2	·8337	·6658	·4877	·2998	·1035	·8988	2
3	·7494	·5852	·4108	·2266	·0339	·8328	3
4	·6593	·4990	·3284	·1480	12·9592	·7618	4
35	·5632	·4070	·2406	·0642	·8794	·6859	35
6	·4617	·3096	·1475	12·9753	·7946	·6053	6
7	·3551	·2073	·0494	·8817	·7054	·5204	7
8	·2432	·0999	12·9465	·7832	·6114	·4309	8
9	·1249	12·9862	·8374	·6787	·5116	·3358	9
40	———	·8655	·7215	·5676	·4053	·2343	40
1	19·0768	———	·5970	·4482	·2909	·1249	1
2	18·9490	18·8106	———	·3190	·1669	·0062	2
3	·8226	·6791	18·5365	———	·0336	11·8782	3
4	·6980	·5495	·4017	18·2547	———	·7422	4
45	·5755	·4220	·2689	·1166	17·9657	———	45
6	·4556	·2972	·1389	17·9812	·8248	17·6700	6
7	·3388	·1754	·0120	·8488	·6869	·5264	7
8	·2249	·0566	17·8880	·7195	·5521	·3858	8
9	·1139	17·9407	·7670	·5932	·4202	·2483	9
50	·0059	·8279	·6491	·4700	·2915	·1139	50
1	17·9007	·7180	·5342	·3498	·1659	16·9826	1
2	·7983	·6109	·4223	·2327	·0433	·8544	2
3	·6991	·5071	·3136	·1190	16·9242	·7297	3
4	·6031	·4068	·2085	·0088	·8089	·6088	4

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
10	13·6016	13·3409	13·0760	12·8062	12·5312	12·2497	10
1	·5922	·3325	·0686	·7996	·5255	·2448	1
2	·5678	·3094	·0468	·7792	·5062	·2268	2
3	·5310	·2742	·0132	·7469	·4756	·1975	3
4	·4849	.2297	12·9704	·7059	·4362	·1598	4
15	·4322	·1790	·9214	·6588	·3908	·1162	15
6	·3765	·1251	·8696	·6087	·3426	·0699	6
7	·3213	·0719	·8181	·5593	·2949	·0239	7
8	·2703	·0227	·7708	·5136	·2512	11·9819	8
9	·2276	12·9818	·7315	·4760	·2151	·9475	9
20	·1943	·9502	·7015	·4475	·1880	·9218	20
1	·1659	·9233	·6762	·4237	·1656	·9007	1
2	·1397	·8988	·6532	·4022	·1457	·8821	2
3	·1120	·8728	·6290	·3796	·1245	·8625	3
4	·0797	·8424	·6004	·3528	·0995	·8391	4
25	·0417	·8067	·5666	·3210	·0695	·8110	25
6	12·9992	·7664	·5287	·2851	·0357	·7792	6
7	·9527	·7223	·4869	·2458	11·9985	·7441	7
8	·9040	·6762	·4433	·2046	·9597	·7075	8
9	·8535	·6285	·3982	·1620	·9196	·6698	9
30	·8009	·5787	·3513	·1177	·8779	·6306	30
1	·7463	·5271	·3026	·0719	·8348	·5901	1
2	·6880	·4720	·2506	·0229	·7887	·5469	2
3	·6254	·4129	·1948	11·9703	·7392	·5004	3
4	·5582	·3492	·1347	·9135	·6858	·4502	4
35	·4862	·2811	·0702	·8527	·6285	·3963	35
6	·4096	·2085	·0015	·7879	·5674	·3388	6
7	·3289	·1320	11·9291	·7195	·5029	·2782	7
8	·2439	·0513	·8527	·6473	·4348	·2141	8
9	·1534	11·9654	·7712	·5702	·3621	·1456	9
40	·0568	·8735	·6841	·4877	·2841	·0721	40
1	11·9523	·7740	·5895	·3980	·1992	10·9919	1
2	·8388	·6656	·4863	·2999	·1062	·9039	2
3	·7162	·5485	·3745	·1934	·0050	·8080	3
4	·5857	·4235	·2550	·0795	10·8966	·7050	4
45	·4470	·2905	·1278	10·9579	·7807	·5948	45
6		·1511	10·9942	·8302	·6588	·4788	6
7	17·3684		·8552	·6971	·5317	·3576	7
8	·2220	17·0609		·5581	·3988	·2309	8
9	·0786	16·9116	16·7473		·2591	·0975	9
50	16·9384	·7654	·5950	16·4273		9·9570	50
1	·8012	·6223	·4457	·2717	16·1006		1
2	·6672	·4822	·2995	·1192	15·9416	15·7666	2
3	·5367	·3457	·1569	15·9703	·7862	·6045	3
4	·4101	·2132	·0183	·8254	·6349	·4465	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
10	11·9607	11·6657	11·3657	11·0611	10·7528	10·4410	10
1	·9568	·6626	·3634	·0595	·7518	·4408	1
2	·9399	·6468	·3488	·0460	·7393	·4293	2
3	·9121	·6204	·3238	·0224	·7171	·4084	3
4	·8760	·5860	·2909	10·9910	·6873	·3801	4
15	·8342	·5459	·2526	·9544	·6523	·3468	15
6	·7896	·5031	·2115	·9151	·6147	·3109	6
7	·7455	·4607	·1709	·8761	·5774	·2752	7
8	·7051	·4220	·1337	·8406	·5434	·2428	8
9	·6722	·3906	·1038	·8120	·5163	·2168	9
20	·6480	·3676	·0821	·7916	·4969	·1987	20
1	·6282	·3492	·0648	·7754	·4819	·1847	1
2	·6109	·3331	·0500	·7617	·4693	·1731	2
3	·5927	·3162	·0344	·7474	·4561	·1610	3
4	·5709	·2959	·0155	·7299	·4399	·1460	4
25	·5445	·2712	10·9925	·7083	·4198	·1274	25
6	·5146	·2432	·9662	·6837	·3968	·1058	6
7	·4815	·2121	·9370	·6564	·3712	·0819	7
8	·4471	·1798	·9067	·6280	·3447	·0571	8
9	·4117	·1465	·8755	·5989	·3175	·0318	9
30	·3750	·1121	·8433	·5688	·2894	·0056	30
1	·3370	·0767	·8102	·5379	·2607	9·9790	1
2	·2965	·0388	·7749	·5049	·2300	·9505	2
3	·2529	10·9980	·7368	·4695	·1969	·9197	3
4	·2058	·9539	·6955	·4310	·1612	·8864	4
35	·1552	·9065	·6512	·3896	·1226	·8507	35
6	·1013	·8559	·6040	·3455	·0815	·8124	6
7	·0443	·8026	·5540	·2990	·0382	·7721	7
8	10·9842	·7462	·5014	·2498	9·9925	·7297	8
9	·9199	·6860	·4451	·1972	·9435	·6843	9
40	·8508	·6211	·3844	·1406	·8907	·6352	40
1	·7753	·5502	·3178	·0784	·8327	·5811	1
2	·6921	·4719	·2443	·0094	·7681	·5209	2
3	·6014	·3862	·1637	9·9337	·6972	·4545	3
4	·5039	·2941	·0767	·8519	·6204	·3826	4
45	·3993	·1951	9·9833	·7638	·5376	·3049	45
6	·2891	·0907	·8846	·6708	·4500	·2228	6
7	·1740	9·9816	·7814	·5734	·3584	·1366	7
8	·0534	·8671	·6730	·4710	·2619	·0461	8
9	9·9263	·7463	·5585	·3627	·1598	8·9500	9
50	·7923	·6188	·4374	·2481	·0516	·8480	50
1	·6501	·4833	·3086	·1259	8·9359	·7389	1
2	——	·3386	·1707	8·9949	·8118	·6215	2
3	15·4255	——	·0246	·8558	·6796	·4963	3
4	·2607	15·0779	——	·7091	·5401	·3639	4

[195] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
10	10·1263	9·8083	9·4891	9·1694	8·8502	8·5324	10
1	·1266	·8093	·4905	·1714	·8527	·5353	1
2	·1162	·7998	·4819	·1637	·8459	·5293	2
3	·0965	·7814	·4647	·1477	·8309	·5155	3
4	·0697	·7561	·4409	·1251	·8098	·4956	4
15	·0380	·7258	·4122	·0980	·7841	·4714	15
6	·0037	·6932	·3811	·0685	·7561	·4449	6
7	9·9697	·6607	·3502	·0390	·7282	·4183	7
8	·9387	·6313	·3221	·0124	·7027	·3943	8
9	·9141	·6079	·3000	8·9914	·6829	·3754	9
20	·8969	·5918	·2849	·9772	·6696	·3630	20
1	·8840	·5797	·2737	·9669	·6601	·3542	1
2	·8733	·5700	·2648	·9588	·6528	·3476	2
3	·8623	·5599	·2557	·9505	·6453	·3409	3
4	·8485	·5472	·2440	·9398	·6355	·3320	4
25	·8311	·5312	·2291	·9261	·6229	·3203	25
6	·8112	·5125	·2119	·9100	·6080	·3066	6
7	·7888	·4917	·1924	·8920	·5912	·2910	7
8	·7656	·4701	·1724	·8733	·5740	·2750	8
9	·7420	·4482	·1519	·8544	·5564	·2588	9
30	·7178	·4256	·1311	·8351	·5385	·2423	30
1	·6930	·4027	·1099	·8155	·5205	·2257	1
2	·6665	·3783	·0873	·7947	·5013	·2080	2
3	·6381	·3519	·0629	·7722	·4806	·1890	3
4	·6072	·3233	·0365	·7478	·4581	·1683	4
35	·5739	·2924	·0080	·7215	·4339	·1460	35
6	·5385	·2596	8·9776	·6934	·4080	·1222	6
7	·5011	·2251	·9457	·6640	·3810	·0974	7
8	·4618	·1887	·9121	·6331	·3526	·0714	8
9	·4196	·1497	·8762	·6001	·3222	·0435	9
40	·3742	·1076	·8373	·5643	·2893	·0134	40
1	·3239	·0611	·7943	·5246	·2528	7·9798	1
2	·2678	·0090	·7460	·4799	·2116	·9419	2
3	·2059	8·9513	·6924	·4302	·1656	·8994	3
4	·1387	·8887	·6341	·3761	·1155	·8531	4
45	·0660	·8208	·5709	·3173	·0610	·8026	45
6	8·9891	·7490	·5039	·2551	·0031	·7491	6
7	·9084	·6736	·4337	·1897	7·9425	·6929	7
8	·8234	·5941	·3596	·1208	·8785	·6337	8
9	·7333	·5097	·2808	·0475	·8105	·5706	9
50	·6376	·4201	·1970	7·9693	·7378	·5033	50
1	·5349	·3237	·1068	·8851	·6594	·4304	1
2	·4242	·2196	·0092	·7938	·5741	·3511	2
3	·3059	·1082	7·9045	·6957	·4824	·2655	3
4	·1806	7·9899	·7932	·5912	·3846	·1742	4

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
10	8·2168	7·9025	7·5885	7·2739	6·9582	6·6393	10
1	·2202	·9062	·5925	·2782	·9628	·6441	1
2	·2149	·9017	·5887	·2751	·9603	·6422	2
3	·2022	·8900	·5780	·2654	·9515	·6343	3
4	·1836	·8726	·5619	·2504	·9377	·6216	4
15	·1608	·8512	·5417	·2316	·9201	·6052	15
6	·1357	·8275	·5194	·2105	·9004	·5868	6
7	·1105	·8036	·4968	·1893	·8803	·5680	7
8	·0876	·7820	·4764	·1699	·8621	·5509	8
9	·0699	·7652	·4606	·1551	·8482	·5378	9
20	·0583	·7544	·4504	·1456	·8394	·5296	20
1	·0502	·7469	·4436	·1394	·8337	·5244	1
2	·0442	·7416	·4388	·1352	·8299	·5211	2
3	·0382	·7362	·4341	·1309	·8262	·5179	3
4	·0301	·7289	·4275	·1250	·8209	·5132	4
25	·0194	·7191	·4185	·1168	·8135	·5065	25
6	·0067	·7074	·4077	·1069	·8044	·4982	6
7	7·9923	·6940	·3954	·0956	·7940	·4886	7
8	·9774	·6803	·3828	·0839	·7833	·4788	8
9	·9625	·6665	·3701	·0723	·7726	·4690	9
30	·9473	·6525	·3572	·0605	·7618	·4592	30
1	·9320	·6386	·3444	·0488	·7512	·4495	1
2	·9158	·6237	·3308	·0364	·7399	·4393	2
3	·8983	·6077	·3162	·0230	·7277	·4282	3
4	·8793	·5902	·3002	·0084	·7144	·4161	4
35	·8588	·5714	·2830	6·9927	·7001	·4031	35
6	·8370	·5514	·2647	·9760	·6849	·3893	6
7	·8142	·5306	·2457	·9587	·6692	·3751	7
8	·7904	·5089	·2259	·9407	·6529	·3604	8
9	·7650	·4856	·2048	·9216	·6355	·3447	9
40	·7374	·4605	·1819	·9008	·6168	·3278	40
1	·7066	·4324	·1562	·8775	·5957	·3087	1
2	·6717	·4004	·1270	·8508	·5714	·2867	2
3	·6326	·3644	·0940	·8206	·5439	·2617	3
4	·5899	·3251	·0579	·7876	·5136	·2342	4
45	·5433	·2821	·0184	·7513	·4805	·2039	45
6	·4938	·2365	6·9764	·7128	·4453	·1719	6
7	·4420	·1887	·9325	·6726	·4085	·1383	7
8	·3872	·1383	·8862	·6301	·3697	·1030	8
9	·3289	·0845	·8367	·5848	·3283	·0654	9
50	·2666	·0270	·7839	·5363	·2840	·0250	50
1	·1991	6·9647	·7264	·4836	·2357	5·9810	1
2	·1255	·8965	·6635	·4257	·1826	·9325	2
3	·0459	·8227	·5953	·3628	·1248	·8795	3
4	6·9608	·7437	·5220	·2952	·0626	·8225	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
10	6·3206	6·0049	5·6966	5·3998	5·1185	4·8528	10
1	·3255	·0100	·7017	·4050	·1237	·8580	1
2	·3241	·0091	·7012	·4049	·1240	·8586	2
3	·3171	·0028	·6957	·4001	·1198	·8549	3
4	·3054	5·9921	·6860	·3913	·1118	·8478	4
15	·2903	·9782	·6732	·3794	·1009	·8378	15
6	·2731	·9622	·6583	·3657	·0882	·8260	6
7	·2556	·9458	·6430	·3514	·0749	·8136	7
8	·2395	·9308	·6290	·3383	·0627	·8022	8
9	·2272	·9193	·6183	·3283	·0533	·7934	9
20	·2197	·9123	·6118	·3223	·0478	·7883	20
1	·2149	·9080	·6079	·3188	·0446	·7854	1
2	·2120	·9055	·6057	·3169	·0429	·7839	2
3	·2092	·9031	·6037	·3151	·0415	·7827	3
4	·2051	·8994	·6004	·3123	·0390	·7806	4
25	·1990	·8939	·5955	·3079	·0351	·7771	25
6	·1915	·8871	·5893	·3023	·0300	·7725	6
7	·1827	·8791	·5821	·2957	·0240	·7670	7
8	·1738	·8709	·5746	·2889	·0178	·7614	8
9	·1648	·8628	·5672	·2822	·0117	·7558	9
30	·1559	·8547	·5599	·2755	·0056	·7503	30
1	·1471	·8467	·5527	·2690	4·9998	·7451	1
2	·1378	·8384	·5451	·2622	·9936	·7395	2
3	·1278	·8293	·5369	·2548	·9869	·7335	3
4	·1169	·8194	·5279	·2467	·9796	·7269	4
35	·1050	·8087	·5183	·2380	·9717	·7197	35
6	·0926	·7974	·5081	·2288	·9634	·7122	6
7	·0797	·7858	·4976	·2194	·9549	·7046	7
8	·0664	·7739	·4870	·2098	·9464	·6969	8
9	·0524	·7613	·4756	·1997	·9373	·6888	9
40	·0372	·7477	·4635	·1888	·9277	·6802	40
1	·0200	·7322	·4497	·1765	·9166	·6703	1
2	·0001	·7143	·4335	·1620	·9036	·6586	2
3	5·9775	·6938	·4151	·1453	·8885	·6451	3
4	·9525	·6712	·3946	·1268	·8718	·6300	4
45	·9249	·6462	·3719	·1063	·8532	·6132	45
6	·8957	·6197	·3479	·0845	·8335	·5954	6
7	·8653	·5921	·3229	·0619	·8131	·5769	7
8	·8332	·5631	·2967	·0382	·7918	·5576	8
9	·7990	·5321	·2687	·0130	·7690	·5371	9
50	·7624	·4989	·2387	4·9860	·7446	·5152	50
1	·7224	·4627	·2060	·9564	·7179	·4911	1
2	·6782	·4225	·1696	·9234	·6881	·4641	2
3	·6299	·3786	·1297	·8873	·6553	·4345	3
4	·5778	·3311	·0865	·8481	·6198	·4023	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
10	4·5929	4·3406	4·0946	3·8524	3·6173	3·3941	10
1	·5980	·3457	·0995	·8572	·6219	·3986	1
2	·5988	·3467	·1008	·8586	·6234	·4002	2
3	·5958	·3441	·0986	·8568	·6220	·3990	3
4	·5893	·3384	·0935	·8523	·6180	·3955	4
15	·5802	·3301	·0859	·8455	·6118	·3900	15
6	·5693	·3201	·0768	·8371	·6042	·3830	6
7	·5578	·3094	·0669	·8281	·5959	·3754	7
8	·5472	·2995	·0577	·8195	·5880	·3681	8
9	·5390	·2919	·0506	·8129	·5819	·3624	9
20	·5342	·2875	·0465	·8092	·5784	·3592	20
1	·5315	·2850	·0443	·8071	·5766	·3576	1
2	·5303	·2840	·0434	·8064	·5759	·3570	2
3	·5294	·2832	·0428	·8059	·5756	·3568	3
4	·5275	·2816	·0415	·8048	·5747	·3560	4
25	·5244	·2789	·0390	·8026	·5728	·3544	25
6	·5203	·2751	·0357	·7997	·5701	·3520	6
7	·5153	·2706	·0316	·7960	·5668	·3490	7
8	·5101	·2659	·0274	·7922	·5633	·3459	8
9	·5051	·2614	·0232	·7884	·5600	·3429	9
30	·5001	·2569	·0192	·7848	·5567	·3399	30
1	·4954	·2526	·0154	·7814	·5536	·3372	1
2	·4904	·2481	·0113	·7778	·5504	·3344	2
3	·4850	·2433	·0070	·7739	·5470	·3312	3
4	·4790	·2379	·0021	·7695	·5431	·3278	4
35	·4726	·2321	3·9969	·7648	·5389	·3240	35
6	·4658	·2260	·9914	·7599	·5344	·3200	6
7	·4589	·2198	·9859	·7550	·5300	·3161	7
8	·4521	·2137	·9804	·7501	·5257	·3123	8
9	·4449	·2073	·9748	·7451	·5213	·3084	9
40	·4372	·2005	·9687	·7398	·5166	·3043	40
1	·4284	·1927	·9618	·7337	·5112	·2995	1
2	·4179	·1833	·9535	·7263	·5047	·2937	2
3	·4057	·1724	·9437	·7175	·4969	·2868	3
4	·3921	·1601	·9327	·7077	·4881	·2790	4
45	·3769	·1464	·9204	·6966	·4782	·2701	45
6	·3609	·1319	·9073	·6849	·4677	·2607	6
7	·3442	·1170	·8939	·6729	·4569	·2510	7
8	·3269	·1014	·8799	·6604	·4458	·2411	8
9	·3084	·0848	·8651	·6471	·4340	·2306	9
50	·2887	·0671	·8493	·6330	·4214	·2194	50
1	·2670	·0477	·8318	·6175	·4076	·2071	1
2	·2427	·0258	·8122	·6000	·3920	·1932	2
3	·2159	·0017	·7906	·5805	·3746	·1777	3
4	·1868	3·9755	·7670	·5594	·3557	·1608	4

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
10	3·1886	2·9980	2·8261	2·6652	2·5048	2·3350	10
1	·1928	3·0022	·8301	·6691	·5085	·3385	1
2	·1945	·0039	·8319	·6709	·5104	·3404	2
3	·1936	·0033	·8315	·6708	·5104	·3407	3
4	·1906	·0006	·8292	·6688	·5088	·3394	4
15	·1856	2·9961	·8251	·6652	·5056	·3367	15
6	·1792	·9903	·8198	·6604	·5013	·3329	6
7	·1722	·9838	·8139	·6549	·4963	·3284	7
8	·1654	·9776	·8081	·6495	·4913	·3238	8
9	·1602	·9727	·8035	·6453	·4874	·3202	9
20	·1572	·9700	·8010	·6429	·4852	·3182	20
1	·1557	·9686	·7997	·6418	·4841	·3172	1
2	·1553	·9682	·7994	·6415	·4840	·3171	2
3	·1552	·9682	·7994	·6416	·4841	·3173	3
4	·1545	·9677	·7990	·6413	·4839	·3172	4
25	·1531	·9664	·7979	·6404	·4831	·3165	25
6	·1510	·9645	·7963	·6389	·4818	·3154	6
7	·1482	·9621	·7941	·6369	·4800	·3138	7
8	·1454	·9596	·7918	·6349	·4782	·3122	8
9	·1427	·9571	·7896	·6329	·4764	·3107	9
30	·1401	·9547	·7874	·6310	·4747	·3092	30
1	·1376	·9526	·7855	·6292	·4732	·3079	1
2	·1351	·9503	·7835	·6274	·4716	·3065	2
3	·1323	·9478	·7812	·6254	·4699	·3050	3
4	·1292	·9450	·7787	·6232	·4679	·3032	4
35	·1258	·9420	·7760	·6207	·4657	·3013	35
6	·1223	·9388	·7731	·6181	·4634	·2993	6
7	·1187	·9356	·7703	·6156	·4611	·2973	7
8	·1153	·9326	·7676	·6133	·4591	·2955	8
9	·1119	·9296	·7650	·6109	·4570	·2937	9
40	·1083	·9264	·7622	·6085	·4550	·2920	40
1	·1041	·9227	·7590	·6057	·4526	·2900	1
2	·0990	·9182	·7550	·6022	·4495	·2874	2
3	·0928	·9127	·7501	·5979	·4457	·2841	3
4	·0858	·9064	·7445	·5929	·4413	·2803	4
45	·0778	·8993	·7381	·5872	·4363	·2759	45
6	·0694	·8917	·7313	·5811	·4309	·2712	6
7	·0608	·8840	·7244	·5749	·4254	·2664	7
8	·0519	·8761	·7173	·5686	·4198	·2616	8
9	·0426	·8678	·7099	·5620	·4140	·2565	9
50	·0327	·8590	·7021	·5551	·4080	·2513	50
1	·0217	·8492	·6934	·5475	·4013	·2455	1
2	·0093	·8382	·6836	·5387	·3936	·2389	2
3	2·9954	·8258	·6725	·5289	·3850	·2314	3
4	·9803	·8123	·6604	·5182	·3755	·2232	4

[200] Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

H^M.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
10	2·1559	1·9449	1·7062	1·4608	1·2092	0·9376	10
1	·1592	·9478	·7087	·4628	·2108	·9387	1
2	·1610	·9495	·7102	·4642	·2118	·9395	2
3	·1614	·9500	·7108	·4648	·2124	·9400	3
4	·1605	·9494	·7104	·4646	·2123	·9400	4
15	·1582	·9476	·7092	·4637	·2118	·9397	15
6	·1550	·9449	·7070	·4621	·2106	·9390	6
7	·1510	·9416	·7043	·4600	·2091	·9379	7
8	·1469	·9380	·7013	·4576	·2072	·9366	8
9	·1437	·9351	·6989	·4555	·2056	·9355	9
20	·1418	·9335	·6974	·4543	·2047	·9348	20
1	·1409	·9327	·6967	·4537	·2042	·9344	1
2	·1408	·9326	·6966	·4537	·2041	·9343	2
3	·1410	·9328	·6969	·4539	·2043	·9344	3
4	·1410	·9329	·6970	·4540	·2044	·9345	4
25	·1405	·9325	·6967	·4538	·2043	·9345	25
6	·1395	·9317	·6961	·4534	·2040	·9343	6
7	·1382	·9306	·6952	·4527	·2035	·9340	7
8	·1368	·9294	·6943	·4519	·2029	·9336	8
9	·1355	·9283	·6933	·4512	·2024	·9332	9
30	·1342	·9272	·6925	·4505	·2019	·9328	30
1	·1331	·9263	·6917	·4500	·2015	·9326	1
2	·1319	·9254	·6910	·4494	·2011	·9323	2
3	·1306	·9243	·6902	·4488	·2006	·9320	3
4	·1292	·9231	·6892	·4481	·2001	·9317	4
35	·1275	·9217	·6881	·4472	·1995	·9312	35
6	·1257	·9202	·6869	·4463	·1988	·9307	6
7	·1240	·9188	·6857	·4453	·1981	·9303	7
8	·1224	·9175	·6847	·4445	·1974	·9298	8
9	·1210	·9163	·6837	·4438	·1969	·9294	9
40	·1195	·9151	·6828	·4431	·1964	·9291	40
1	·1179	·9139	·6819	·4424	·1959	·9288	1
2	·1157	·9121	·6805	·4414	·1953	·9284	2
3	·1130	·9099	·6788	·4401	·1943	·9278	3
4	·1098	·9072	·6767	·4386	·1932	·9270	4
45	·1059	·9041	·6742	·4366	·1918	·9261	45
6	·1019	·9007	·6714	·4345	·1902	·9250	6
7	·0978	·8973	·6687	·4324	·1886	·9239	7
8	·0937	·8939	·6660	·4302	·1871	·9228	8
9	·0894	·8903	·6632	·4281	·1855	·9217	9
50	·0850	·8867	·6603	·4259	·1839	·9207	50
1	·0801	·8827	·6572	·4235	·1822	·9195	1
2	·0744	·8781	·6535	·4208	·1802	·9182	2
3	·0681	·8729	·6494	·4176	·1778	·9166	3
4	·0611	·8671	·6448	·4141	·1753	·9149	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
10	0·6684	0·4107	0·1766	10
1	·6692	·4111	·1768	1
2	·6697	·4114	·1769	2
3	·6700	·4116	·1769	3
4	·6701	·4116	·1770	4
15	·6699	·4115	·1770	15
6	·6695	·4113	·1769	6
7	·6689	·4110	·1768	7
8	·6681	·4106	·1766	8
9	·6673	·4102	·1764	9
20	·6668	·4099	·1763	20
1	·6666	·4097	·1763	1
2	·6665	·4097	·1763	2
3	·6666	·4097	·1763	3
4	·6667	·4098	·1763	4
25	·6666	·4098	·1763	25
6	·6666	·4097	·1763	6
7	·6663	·4096	·1762	7
8	·6661	·4095	·1762	8
9	·6659	·4094	·1761	9
30	·6656	·4092	·1761	30
1	·6655	·4092	·1761	1
2	·6653	·4091	·1760	2
3	·6651	·4090	·1760	3
4	·6649	·4089	·1760	4
35	·6647	·4087	·1759	35
6	·6644	·4086	·1759	6
7	·6640	·4084	·1758	7
8	·6638	·4083	·1757	8
9	·6635	·4081	·1757	9
40	·6633	·4080	·1756	40
1	·6631	·4079	·1756	1
2	·6629	·4078	·1756	2
3	·6625	·4076	·1755	3
4	·6621	·4074	·1754	4
45	·6615	·4071	·1753	45
6	·6608	·4067	·1752	6
7	·6602	·4064	·1750	7
8	·6595	·4060	·1749	8
9	·6588	·4057	·1748	9
50	·6582	·4053	·1746	50
1	·6575	·4050	·1745	1
2	·6567	·4045	·1744	2
3	·6557	·4040	·1742	3
4	·6546	·4035	·1740	4

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
55	22·4413	22·3232	22·1914	22·0489	21·8987	21·7434	55
6	·4106	·2919	·1591	·0152	·8634	·7065	6
7	·3812	·2617	·1279	21·9827	·8291	·6708	7
8	·3527	·2327	·0978	·9514	·7966	·6364	8
9	·3256	·2049	·0691	·9214	·7651	·6035	9
60	·2995	·1784	·0417	·8928	·7350	·5718	60
1	·2747	·1530	·0154	·8653	·7063	·5415	1
2	·2512	·1290	21·9905	·8394	·6789	·5127	2
3	·2288	·1062	·9669	·8146	·6529	·4852	3
4	·2078	·0847	·9447	·7913	·6283	·4592	4
65	·1877	·0643	·9235	·7691	·6049	·4344	65
6	·1688	·0451	·9036	·7482	·5827	·4110	6
7	·1511	·0271	·8849	·7285	·5619	·3888	7
8	·1343	·0100	·8672	·7099	·5421	·3678	8
9	·1184	21·9939	·8505	·6923	·5234	·3479	9
70	·1036	·9790	·8351	·6760	·5061	·3293	70
1	·0899	·9651	·8207	·6609	·4900	·3120	1
2	·0772	·9524	·8076	·6470	·4751	·2960	2
3	·0657	·9408	·7956	·6343	·4615	·2815	3
4	·0553	·9304	·7848	·6229	·4493	·2683	4
75	·0458	·9209	·7750	·6126	·4381	·2562	75
6	·0371	·9123	·7662	·6031	·4280	·2452	6
7	·0291	·9043	·7580	·5945	·4186	·2350	7
8	·0217	·8971	·7505	·5866	·4101	·2258	8
9	·0150	·8905	·7438	·5795	·4024	·2173	9
80	·0088	·8845	·7377	·5730	·3954	·2097	80
1	·0033	·8791	·7322	·5673	·3892	·2028	1
2	21·9983	·8744	·7274	·5622	·3836	·1967	2
3	·9940	·8701	·7231	·5576	·3787	·1913	3
4	·9900	·8663	·7192	·5535	·3742	·1864	4
85	·9865	·8629	·7158	·5498	·3702	·1819	85
6	·9830	·8596	·7124	·5463	·3663	·1776	6
7	·9797	·8565	·7093	·5429	·3626	·1734	7
8	·9764	·8534	·7063	·5398	·3591	·1695	8
9	·9729	·8503	·7033	·5367	·3557	·1656	9
90	·9694	·8472	·7004	·5337	·3525	·1618	90
1	·9662	·8445	·6978	·5311	·3497	·1587	1
2	·9632	·8419	·6956	·5289	·3474	·1560	2
3	·9604	·8396	·6935	·5269	·3453	·1537	3
4	·9581	·8376	·6918	·5254	·3437	·1520	4
95	·9561	·8360	·6904	·5241	·3425	·1507	95
6	·9548	·8349	·6895	·5234	·3417	·1498	6

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
55	21·5860	21·4290	21·2747	21·1256	20·9815	20·8389	55
6	·5474	·3887	·2329	·0823	·9372	·7934	6
7	·5100	·3497	·1923	·0386	·8942	·7494	7
8	·4740	·3120	·1532	20·9981	·8528	·7069	8
9	·4394	·2759	·1155	·9602	·8128	·6661	9
60	·4062	·2411	·0794	·9238	·7744	·6268	60
1	·3743	·2078	·0446	·8879	·7376	·5891	1
2	·3440	·1759	·0116	·8537	·7025	·5532	2
3	·3150	·1456	20·9798	·8210	·6689	·5189	3
4	·2876	·1168	·9499	·7899	·6370	·4863	4
65	·2614	·0893	·9211	·7602	·6065	·4552	65
6	·2366	·0632	·8938	·7319	·5776	·4256	6
7	·2132	·0384	·8680	·7051	·5501	·3975	7
8	·1908	·0149	·8433	·6795	·5238	·3707	8
9	·1696	20·9924	·8197	·6551	·4988	·3452	9
70	·1498	·9713	·7976	·6322	·4752	·3212	70
1	·1313	·9517	·7769	·6107	·4532	·2987	1
2	·1142	·9335	·7577	·5907	·4327	·2778	2
3	·0985	·9168	·7401	·5724	·4139	·2586	3
4	·0843	·9016	·7240	·5557	·3967	·2411	4
75	·0713	·8877	·7093	·5404	·3810	·2251	75
6	·0594	·8749	·6957	·5262	·3665	·2104	6
7	·0483	·8630	·6831	·5130	·3529	·1966	7
8	·0382	·8521	·6715	·5009	·3405	·1839	8
9	·0290	·8420	·6608	·4897	·3289	·1722	9
80	·0206	·8329	·6510	·4794	·3184	·1614	80
1	·0131	·8247	·6422	·4702	·3089	·1517	1
2	·0064	·8174	·6344	·4619	·3004	·1431	2
3	·0004	·8109	·6273	·4545	·2927	·1353	3
4	20·9950	·8049	·6209	·4478	·2858	·1283	4
85	·9900	·7995	·6151	·4416	·2795	·1218	85
6	·9852	·7942	·6094	·4356	·2733	·1156	6
7	·9805	·7890	·6038	·4297	·2672	·1094	7
8	·9760	·7840	·5983	·4238	·2612	·1033	8
9	·9716	·7789	·5927	·4179	·2550	·0970	9
90	·9673	·7740	·5872	·4119	·2489	·0908	90
1	·9636	·7697	·5823	·4067	·2434	·0852	1
2	·9605	·7660	·5781	·4020	·2384	·0801	2
3	·9577	·7628	·5743	·3977	·2339	·0755	3
4	·9557	·7603	·5713	·3944	·2304	·0718	4
95	·9542	·7585	·5691	·3918	·2276	·0690	95
6	·9532	·7573	·5677	·3902	·2258	·0670	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hᴹ.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
55	20·6955	20·5486	20·3965	20·2388	20·0763	19·9098	55
6	·6489	·5009	·3475	·1883	·0242	·8560	6
7	·6039	·4548	·3002	·1395	19·9740	·8041	7
8	·5605	·4103	·2545	·0926	·9254	·7540	8
9	·5187	·3676	·2107	·0474	·8790	·7060	9
60	·4786	·3265	·1686	·0042	·8343	·6600	60
1	·4401	·2872	·1283	19·9627	·7917	·6159	1
2	·4034	·2497	·0899	·9232	·7510	·5740	2
3	·3684	·2139	·0532	·8856	·7122	·5340	3
4	·3352	·1800	·0185	·8499	·6755	·4961	4
65	·3034	·1476	19·9853	·8158	·6404	·4600	65
6	·2733	·1168	·9538	·7835	·6072	·4257	6
7	·2446	·0877	·9240	·7529	·5757	·3932	7
8	·2174	·0599	·8956	·7237	·5457	·3623	8
9	·1914	·0334	·8685	·6959	·5171	·3329	9
70	·1670	·0086	·8431	·6699	·4903	·3053	70
1	·1441	19·9853	·8194	·6456	·4653	·2795	1
2	·1229	·9637	·7974	·6230	·4421	·2555	2
3	·1034	·9440	·7772	·6023	·4208	·2336	3
4	·0857	·9259	·7588	·5834	·4014	·2136	4
75	·0695	·9095	·7420	·5662	·3837	·1954	75
6	·0545	·8942	·7265	·5503	·3673	·1785	6
7	·0405	·8801	·7121	·5355	·3522	·1629	7
8	·0277	·8671	·6988	·5220	·3382	·1485	8
9	·0158	·8551	·6866	·5095	·3253	·1352	9
80	·0050	·8441	·6754	·4980	·3136	·1231	80
1	19·9952	·8342	·6654	·4877	·3030	·1122	1
2	·9864	·8253	·6564	·4785	·2935	·1025	2
3	·9786	·8174	·6483	·4703	·2851	·0937	3
4	·9715	·8103	·6411	·4629	·2774	·0858	4
85	·9650	·8037	·6344	·4560	·2704	·0786	85
6	·9586	·7973	·6279	·4494	·2636	·0716	6
7	·9524	·7910	·6215	·4429	·2569	·0647	7
8	·9463	·7849	·6153	·4365	·2504	·0579	8
9	·9400	·7786	·6089	·4300	·2437	·0510	9
90	·9338	·7723	·6026	·4236	·2371	·0442	90
1	·9281	·7667	·5970	·4179	·2312	·0381	1
2	·9231	·7617	·5920	·4128	·2260	·0327	2
3	·9185	·7572	·5875	·4082	·2213	·0278	3
4	·9148	·7535	·5838	·4046	·2175	·0240	4
95	·9119	·7507	·5810	·4017	·2147	·0210	95
6	·9099	·7487	·5791	·3998	·2127	·0190	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
55	19·7407	19·5692	19·3953	19·2191	19·0398	18·8573	55
6	·6850	·5116	·3357	·1573	18·9757	·7909	6
7	·6314	·4561	·2783	·0978	·9140	·7269	7
8	·5797	·4027	·2229	·0406	·8548	·6653	8
9	·5301	·3514	·1700	18·9858	·7979	·6064	9
60	·4825	·3024	·1192	·9333	·7436	·5501	60
1	·4371	·2554	·0707	·8832	·6917	·4963	1
2	·3937	·2107	·0246	·8355	·6424	·4452	2
3	·3525	·1681	18·9806	·7901	·5955	·3966	3
4	·3135	·1278	·9390	·7472	·5511	·3507	4
65	·2762	·0894	·8994	·7062	·5088	·3069	65
6	·2408	·0529	·8618	·6675	·4688	·2655	6
7	·2074	·0184	·8262	·6308	·4309	·2264	7
8	·1755	18·9856	·7924	·5959	·3949	·1892	8
9	·1452	·9544	·7602	·5628	·3607	·1539	9
70	·1167	·9251	·7300	·5317	·3287	·1208	70
1	·0902	·8977	·7018	·5027	·2987	·0899	1
2	·0655	·8723	·6756	·4757	·2710	·0613	2
3	·0429	·8490	·6517	·4511	·2456	·0351	3
4	·0223	·8278	·6299	·4286	·2225	·0113	4
75	·0035	·8085	·6100	·4081	·2014	17·9895	75
6	18·9862	·7906	·5916	·3892	·1819	·9694	6
7	·9701	·7740	·5745	·3717	·1639	·9508	7
8	·9552	·7588	·5588	·3555	·1473	·9337	8
9	·9415	·7447	·5443	·3406	·1319	·9179	9
80	·9291	·7318	·5311	·3271	·1180	·9035	80
1	·9178	·7202	·5192	·3148	·1053	·8906	1
2	·9078	·7099	·5085	·3039	·0941	·8790	2
3	·8987	·7006	·4990	·2940	·0840	·8686	3
4	·8906	·6922	·4904	·2852	·0749	·8593	4
85	·8831	·6845	·4824	·2771	·0666	·8507	85
6	·8759	·6771	·4748	·2692	·0585	·8423	6
7	·8688	·6697	·4672	·2614	·0505	·8341	7
8	·8618	·6625	·4598	·2538	·0427	·8261	8
9	·8547	·6552	·4523	·2461	·0347	·8179	9
90	·8476	·6480	·4448	·2385	·0269	·8098	90
1	·8414	·6415	·4382	·2316	·0199	·8026	1
2	·8358	·6357	·4322	·2255	·0136	·7962	2
3	·8307	·6305	·4269	·2200	·0080	·7904	3
4	·8267	·6263	·4226	·2156	·0035	·7858	4
95	·8236	·6231	·4193	·2122	·0000	·7822	95
6	·8215	·6210	·4170	·2099	17·9977	·7798	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
55	18·6717	18·4834	18·2925	18·0998	17·9053	17·7089	55
6	·6025	·4114	·2175	·0216	·8236	·6236	6
7	·5361	·3421	·1454	17·9465	·7452	·5416	7
8	·4721	·2757	·0761	·8743	·6699	·4631	8
9	·4109	·2121	·0099	·8052	·5979	·3879	9
60	·3524	·1512	17·9466	·7393	·5292	·3161	60
1	·2966	·0932	·8863	·6765	·4637	·2477	1
2	·2436	·0381	·8290	·6168	·4015	·1829	2
3	·1932	17·9858	·7746	·5602	·3425	·1214	3
4	·1456	·9364	·7232	·5068	·2869	·0633	4
65	·1003	·8894	·6744	·4560	·2340	·0083	65
6	·0574	·8449	·6282	·4080	·1841	16·9562	6
7	·0169	·8029	·5846	·3627	·1370	·9071	7
8	17·9784	·7630	·5432	·3197	·0923	·8607	8
9	·9419	·7252	·5040	·2790	·0500	·8167	9
70	·9076	·6898	·4672	·2409	·0105	·7755	70
1	·8757	·6567	·4330	·2054	16·9736	·7372	1
2	·8462	·6261	·4013	·1726	·9395	·7019	2
3	·8191	·5981	·3723	·1425	·9084	·6695	3
4	·7945	·5727	·3460	·1153	·8801	·6402	4
75	·7720	·5495	·3220	·0904	·8544	·6135	75
6	·7513	·5280	·2998	·0675	·8306	·5888	6
7	·7321	·5082	·2793	·0463	·8087	·5661	7
8	·7145	·4900	·2605	·0268	·7886	·5452	8
9	·6982	·4732	·2431	·0088	·7700	·5260	9
80	·6833	·4578	·2273	16·9925	·7531	·5085	80
1	·6699	·4440	·2130	·9777	·7378	·4927	1
2	·6580	·4317	·2002	·9646	·7243	·4787	2
3	·6473	·4206	·1888	·9528	·7121	·4661	3
4	·6377	·4107	·1786	·9422	·7012	·4548	4
85	·6288	·4016	·1692	·9325	·6911	·4445	85
6	·6202	·3927	·1600	·9231	·6814	·4345	6
7	·6118	·3840	·1510	·9138	·6719	·4247	7
8	·6034	·3754	·1422	·9047	·6626	·4150	8
9	·5950	·3667	·1332	·8954	·6530	·4052	9
90	·5867	·3581	·1243	·8863	·6436	·3956	90
1	·5792	·3504	·1163	·8781	·6352	·3869	1
2	·5726	·3435	·1092	·8707	·6277	·3792	2
3	·5666	·3374	·1029	·8641	·6209	·3723	3
4	·5619	·3324	·0977	·8589	·6154	·3667	4
95	·5582	·3287	·0938	·8548	·6112	·3624	95
6	·5557	·3261	·0911	·8520	·6084	·3594	6

 Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
55	17·5105	17·3098	17·1070	16·9024	16·6973	16·4919	55
6	·4214	·2165	·0093	·7999	·5898	·3791	6
7	·3357	·1269	16·9153	·7014	·4864	·2706	7
8	·2535	·0409	·8252	·6068	·3871	·1663	8
9	·1750	16·9586	·7389	·5163	·2920	·0664	9
60	·1000	·8801	·6566	·4299	·2013	15·9710	60
1	·0285	·8053	·5782	·3476	·1148	·8801	1
2	16·9608	·7344	·5038	·2695	·0327	·7937	2
3	·8965	·6672	·4333	·1955	15·9549	·7119	3
4	·8359	·6038	·3669	·1257	·8815	·6346	4
65	·7784	·5436	·3038	·0595	·8119	·5614	65
6	·7241	·4869	·2443	15·9970	·7462	·4922	6
7	·6729	·4333	·1882	·9381	·6842	·4270	7
8	·6244	·3826	·1351	·8823	·6257	·3653	8
9	·5786	·3348	·0850	·8297	·5703	·3071	9
70	·5357	·2900	·0381	·7804	·5185	·2526	70
1	·4958	·2484	15·9945	·7347	·4704	·2019	1
2	·4590	·2099	·9543	·6924	·4260	·1552	2
3	·4254	·1748	·9175	·6539	·3855	·1125	3
4	·3948	·1430	·8842	·6190	·3488	·0739	4
75	·3671	·1141	·8540	·5872	·3154	·0387	75
6	·3415	·0874	·8261	·5580	·2847	·0064	6
7	·3179	·0628	·8004	·5310	·2564	14·9766	7
8	·2963	·0403	·7768	·5063	·2304	·9492	8
9	·2763	·0195	·7551	·4836	·2065	·9241	9
80	·2582	·0007	·7354	·4629	·1848	·9012	80
1	·2418	15·9837	·7177	·4443	·1652	·8806	1
2	·2273	·9686	·7019	·4278	·1479	·8624	2
3	·2143	·9551	·6878	·4130	·1324	·8460	3
4	·2026	·9429	·6751	·3997	·1184	·8313	4
85	·1919	·9318	·6635	·3875	·1056	·8178	85
6	·1815	·9210	·6523	·3758	·0933	·8048	6
7	·1714	·9105	·6413	·3643	·0812	·7921	7
8	·1615	·9002	·6306	·3530	·0693	·7797	8
9	·1514	·8897	·6197	·3416	·0574	·7670	9
90	·1415	·8795	·6091	·3305	·0457	·7547	90
1	·1326	·8704	·5996	·3206	·0352	·7437	1
2	·1247	·8623	·5911	·3118	·0260	·7339	2
3	·1176	·8550	·5836	·3039	·0178	·7252	3
4	·1119	·8492	·5776	·2977	·0112	·7183	4
95	·1075	·8447	·5730	·2929	·0062	·7130	95
6	·1045	·8416	·5698	·2896	·0028	·7094	6

[178] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
55	16·2875	16·0848	15·8839	15·6848	15·4878	15·2928	55
6	·1693	15·9608	·7540	·5487	·3453	·1438	6
7	·0553	·8414	·6286	·4173	·2077	14·9996	7
8	15·9458	·7264	·5081	·2908	·0749	·8604	8
9	·8408	·6161	·3923	·1693	14·9473	·7265	9
60	·7106	·5107	·2815	·0529	·8251	·5981	60
1	·6449	·4102	·1758	14·9417	·7083	·4753	1
2	·5542	·3147	·0754	·8360	·5971	·3583	2
3	·4680	·2241	14·9800	·7357	·4914	·2471	3
4	·3867	·1384	·8899	·6408	·3915	·1418	4
65	·3096	·0573	·8044	·5508	·2967	·0418	65
6	·2368	14·9806	·7236	·4657	·2069	13·9472	6
7	·1681	·9082	·6474	·3853	·1222	·8577	7
8	·1031	·8398	·5753	·3093	·0420	·7731	8
9	·0417	·7752	·5072	·2374	13·9662	·6930	9
70	14·9844	·7147	·4435	·1703	·8953	·6181	70
1	·9310	·6585	·3842	·1078	·8294	·5484	1
2	·8818	·6067	·3296	·0502	·7686	·4841	2
3	·8369	·5594	·2798	13·9976	·7130	·4254	3
4	·7962	·5165	·2345	·9499	·6627	·3722	4
75	·7591	·4775	·1935	·9066	·6169	·3238	75
6	·7250	·4416	·1556	·8667	·5748	·2793	6
7	·6937	·4085	·1208	·8300	·5361	·2383	7
8	·6649	·3782	·0889	·7963	·5005	·2008	8
9	·6384	·3503	·0595	·7654	·4679	·1662	9
80	·6143	·3250	·0328	·7372	·4382	·1348	80
1	·5926	·3022	·0088	·7119	·4115	·1066	1
2	·5734	·2819	13·9875	·6894	·3877	·0815	2
3	·5562	·2638	·9684	·6693	·3665	·0591	3
4	·5407	·2475	·9513	·6513	·3475	·0390	4
85	·5265	·2326	·9356	·6348	·3301	·0205	85
6	·5128	·2182	·9205	·6189	·3133	·0028	6
7	·4994	·2041	·9056	·6033	·2969	12·9855	7
8	·4863	·1903	·8911	·5880	·2808	·9685	8
9	·4730	·1763	·8761	·5726	·2646	·9514	9
90	·4601	·1627	·8621	·5575	·2488	·9347	90
1	·4484	·1504	·8493	·5440	·2346	·9198	1
2	·4381	·1396	·8378	·5320	·2220	·9065	2
3	·4289	·1299	·8277	·5214	·2108	·8948	3
4	·4216	·1221	·8195	·5128	·2018	·8853	4
95	·4160	·1162	·8133	·5062	·1950	·8781	95
6	·4121	·1122	·8090	·5017	·1903	·8732	6

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

HM.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
55	15·1001	14·9103	14·7243	——	8·3929	8·2240	55
6	14·9442	·7475	·5543	14·3651	——	·0771	6
7	·7933	·5896	·3893	·1928	14·0007	——	7
8	·6474	·4368	·2294	·0256	13·8261	13·6314	8
9	·5069	·2894	·0750	13·8640	·6571	·4548	9
60	·3720	·1478	13·9264	·7083	·4940	·2843	60
1	·2429	·0121	·7839	·5587	·3372	·1201	1
2	·1199	13·8827	·6478	·4157	·1871	12·9626	2
3	·0027	·7594	·5180	·2792	·0436	·8120	3
4	13·8917	·6424	·3948	·1494	12·9071	·6684	4
65	·7863	·5312	·2775	·0258	·7769	·5314	65
6	·6864	·4257	·1663	12·9084	·6531	·4010	6
7	·5919	·3259	·0608	·7971	·5356	·2770	7
8	·5025	·2314	12·9609	·6914	·4239	·1591	8
9	·4178	·1419	·8662	·5912	·3180	·0471	9
70	·3386	·0580	·7774	·4972	·2185	11·9418	70
1	·2649	12·9799	·6947	·4096	·1256	·8435	1
2	·1968	·9078	·6183	·3286	·0398	·7525	2
3	·1347	·8419	·5484	·2545	11·9612	·6691	3
4	·0783	·7822	·4850	·1871	·8897	·5932	4
75	·0271	·7278	·4273	·1259	·8247	·5241	75
6	12·9799	·6778	·3742	·0694	·7647	·4603	6
7	·9365	·6317	·3252	·0175	·7094	·4016	7
8	·8967	·5894	·2803	11·9697	·6586	·3476	8
9	·8600	·5506	·2390	·9258	·6119	·2978	9
80	·8267	·5152	·2014	·8858	·5693	·2524	80
1	·7968	·4834	·1676	·8498	·5310	·2116	1
2	·7702	·4552	·1376	·8178	·4969	·1753	2
3	·7464	·4299	·1107	·7892	·4664	·1428	3
4	·7251	·4073	·0867	·7636	·4391	·1136	4
85	·7056	·3865	·0645	·7400	·4139	·0868	85
6	·6868	·3665	·0433	·7174	·3897	·0610	6
7	·6684	·3470	·0225	·6952	·3661	·0357	7
8	·6505	·3279	·0022	·6735	·3429	·0110	8
9	·6323	·3086	11·9817	·6516	·3196	10·9860	9
90	·6147	·2899	·9618	·6304	·2969	·9618	90
1	·5988	·2731	·9439	·6114	·2766	·9400	1
2	·5848	·2583	·9281	·5945	·2586	·9208	2
3	·5724	·2451	·9141	·5796	·2427	·9038	3
4	·5624	·2345	·9029	·5676	·2299	·8901	4
95	·5549	·2265	·8943	·5585	·2202	·8797	95
6	·5496	·2209	·8884	·5523	·2135	·8726	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
55	8·0480	7·8645	7·6749	7·4800	7·2803	7·0766	55
6	7·9085	·7324	·5502	·3625	·1699	6·9732	6
7	·7620	·5935	·4187	·2384	·0532	·8636	7
8	—	·4476	·2805	·1077	6·9300	·7478	8
9	13·2575	—	·1350	6·9700	·7999	·6252	9
60	·0793	12·8797	—	·8261	·6637	·4968	60
1	12·9076	·7002	12·4988	—	·5221	·3629	1
2	·7426	·5276	·3185	12·1156	—	·2240	2
3	·5846	·3621	·1452	11·9346	11·7308	—	3
4	·4338	·2039	11·9794	·7611	·5496	11·3451	4
65	·2898	·0525	·8206	·5947	·3755	·1632	65
6	·1524	11·9080	·6688	·4354	·2086	10·9886	6
7	·0217	·7703	·5239	·2831	·0487	·8211	7
8	11·8973	·6391	·3857	·1377	10·8959	·6607	8
9	·7789	·5142	·2539	10·9988	·7497	·5071	9
70	·6676	·3964	·1295	·8676	·6115	·3616	70
1	·5635	·2863	·0131	·7446	·4816	·2248	1
2	·4671	·1841	10·9049	·6303	·3609	·0974	2
3	·3786	·0904	·8056	·5251	·2498	9·9800	3
4	·2981	·0050	·7151	·4292	·1482	·8727	4
75	·2248	10·9271	·6325	·3416	·0555	·7746	75
6	·1570	·8551	·5559	·2604	9·9694	·6834	6
7	·0945	·7886	·4853	·1854	·8897	·5990	7
8	·0370	·7274	·4201	·1161	·8162	·5210	8
9	10·9840	·6709	·3600	·0522	·7482	·4487	9
80	·9357	·6194	·3051	9·9937	·6860	·3826	80
1	·8921	·5730	·2557	·9410	·6299	·3229	1
2	·8535	·5317	·2116	·8940	·5799	·2697	2
3	·8188	·4947	·1721	·8519	·5350	·2218	3
4	·7876	·4615	·1367	·8141	·4947	·1789	4
85	·7590	·4309	·1040	·7792	·4575	·1393	85
6	·7314	·4014	·0725	·7456	·4216	·1011	6
7	·7013	·3725	·0415	·7125	·3863	·0633	7
8	·6779	·3441	·0112	·6800	·3515	·0263	8
9	·6511	·3154	9·9804	·6470	·3162	8·9885	9
90	·6252	·2876	·9505	·6149	·2818	·9517	90
1	·6019	·2625	·9236	·5860	·2508	·9185	1
2	·5813	·2404	·8997	·5603	·2232	·8889	2
3	·5631	·2208	·8787	·5376	·1987	·8626	3
4	·5484	·2051	·8617	·5194	·1790	·8413	4
95	·5373	·1931	·8489	·5055	·1640	·8252	95
6	·5297	·1849	·8400	·4959	·1537	·8140	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^{M}.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
55	6·8698	6·6590	6·4435	6·2225	5·9957	5·7611	55
6	·7731	·5689	·3598	·1450	·9242	·6953	6
7	·6706	·4732	·2707	·0624	·8478	·6250	7
8	·5620	·3716	·1761	·9745	·7664	·5500	8
9	·4468	·2638	·0754	5·8808	·6795	·4696	9
60	·3260	·1504	5·9693	·7819	·5876	·3846	60
1	·1998	·0318	·8582	·6782	·4911	·2952	1
2	·0686	5·9083	·7423	·5699	·3902	·2016	2
3	5·9329	·7804	·6221	·4573	·2852	·1040	3
4	———	·6484	·4979	·3408	·1764	·0028	4
65	10·9586	———	·3689	·2197	·0630	4·8971	65
6	·7762	10·5708	———	·0929	4·9442	·7862	6
7	·6010	·3877	10·1816	———	·8189	·6689	7
8	·4329	·2119	9·9978	9·7908	———	·5446	8
9	·2717	·0430	·8210	·6060	9·3978	———	9
70	·1188	9·8824	·6527	·4297	·2134	9·0038	70
1	9·9748	·7311	·4938	·2630	·0388	8·8210	1
2	·8406	·5898	·3453	·1070	8·8750	·6493	2
3	·7167	·4593	·2079	8·9625	·7231	·4897	3
4	·6034	·3398	·0819	·8297	·5834	·3428	4
75	·4997	·2303	8·9663	·7078	·4550	·2075	75
6	·4032	·1282	·8585	·5940	·3348	·0807	6
7	·3139	·0337	·7585	·4882	·2230	7·9625	7
8	·2312	8·9461	·6658	·3900	·1190	·8525	8
9	·1546	·8649	·5797	·2988	·0223	·7500	9
80	·0844	·7904	·5007	·2150	7·9334	·6555	80
1	·0209	·7230	·4291	·1390	·8527	·5697	1
2	8·9643	·6629	·3652	·0711	·7805	·4929	2
3	·9134	·6088	·3076	·0099	·7153	·4236	3
4	·8677	·5601	·2559	7·9547	·6566	·3610	4
85	·8255	·5151	·2080	·9037	·6021	·3028	85
6	·7848	·4718	·1617	·8543	·5494	·2464	6
7	·7446	·4289	·1160	·8054	·4970	·1903	7
8	·7051	·3868	·0710	·7572	·4454	·1348	8
9	·6648	·3438	·0251	·7082	·3927	·0781	9
90	·6255	·3019	7·9804	·6603	·3414	·0227	90
1	·5900	·2640	·9399	·6170	·2949	6·9724	1
2	·5583	·2301	·9037	·5783	·2534	·9276	2
3	·5301	·2000	·8716	·5440	·2166	·8879	3
4	·5073	·1756	·8455	·5161	·1867	·8557	4
95	·4900	·1570	·8256	·4948	·1639	·8311	95
6	·4779	·1440	·8117	·4800	·1481	·8140	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
55	5·5216	5·2798	5·0398	4·8056	4·5813	4·3673	55
6	·4613	·2248	4·9896	·7599	·5397	·3295	6
7	·3968	·1657	·9357	·7108	·4950	·2889	7
8	·3278	·1025	·8779	·6581	·4469	·2450	8
9	·2539	·0346	·8158	·6012	·3949	·1976	9
60	·1755	4·9625	·7497	·5407	·3395	·1469	60
1	·0929	·8865	·6798	·4767	·2809	·0933	1
2	·0063	·8068	·6065	·4093	·2192	·0367	2
3	4·9160	·7234	·5298	·3389	·1545	3·9774	3
4	·8222	·6368	·4500	·2656	·0872	·9157	4
65	·7242	·5461	·3664	·1886	·0164	·8507	65
6	·6210	·4505	·2780	·1071	3·9414	·7818	6
7	·5117	·3490	·1840	·0202	·8613	·7080	7
8	·3955	·2407	·0835	3·9271	·7751	·6283	8
9	·2703	·1237	3·9744	·8257	·6809	·5410	9
70	———	3·9995	·8583	·7173	·5799	·4470	70
1	8·6117	———	·7363	·6031	·4732	·3474	1
2	·4319	8·2245	———	·4856	·3630	·2443	2
3	·2646	·0494	7·8459	———	·2522	·1403	3
4	·1103	7·8876	·6768	7·4793	———	·0384	4
75	7·9680	·7382	·5203	·3160	7·1262	———	75
6	·8344	·5977	·3730	·1619	6·9655	6·7830	6
7	·7097	·4663	·2349	·0173	·8146	·6259	7
8	·5933	·3435	·1056	6·8816	·6727	·4780	8
9	·4847	·2286	6·9844	·7542	·5393	·3388	9
80	·3845	·1225	·8722	·6361	·4154	·2092	80
1	·2933	·0258	·7699	·5282	·3021	·0906	1
2	·2116	6·9390	·6780	·4311	·2000	5·9837	2
3	·1378	·8605	·5947	·3431	·1073	·8865	3
4	·0711	·7896	·5194	·2635	·0235	·7985	4
85	·0090	·7234	·4491	·1890	5·9449	·7160	85
6	6·9487	·6590	·3806	·1163	·8681	·6351	6
7	·8886	·5946	·3119	·0432	·7907	·5534	7
8	·8290	·5306	·2433	5·9701	·7131	·4714	8
9	·7678	·4647	·1725	·8943	·6324	·3857	9
90	·7079	·3999	·1026	·8192	·5522	·3005	90
1	·6534	·3408	·0386	·7502	·4783	·2218	1
2	·6048	·2879	5·9810	·6879	·4114	·1503	2
3	·5616	·2408	·9296	·6320	·3510	·0857	3
4	·5266	·2025	·8877	·5862	·3014	·0324	4
95	·4999	·1733	·8556	·5510	·2631	4·9913	95
6	·4814	·1530	·8332	·5263	·2361	·9622	6

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
55	4·1552	3·9468	3·7412	3·5362	3·3349	3·1422	55
6	·1209	·9159	·7133	·5111	·3124	·1220	6
7	·0841	·8825	·6831	·4840	·2881	·1002	7
8	·0442	·8464	·6505	·4546	·2616	·0765	8
9	·0010	·8072	·6150	·4226	·2328	·0505	9
60	3·9549	·7652	·5770	·3882	·2018	·0225	60
1	·9059	·7206	·5365	·3515	·1687	2·9927	1
2	·8542	·6736	·4937	·3128	·1337	·9611	2
3	·8000	·6241	·4487	·2721	·0969	·9279	3
4	·7436	·5726	·4019	·2296	·0585	·8933	4
65	·6842	·5184	·3526	·1849	·0181	·8568	65
6	·6210	·4607	·3000	·1372	2·9749	·8178	6
7	·5532	·3987	·2435	·0858	·9283	·7756	7
8	·4799	·3314	·1820	·0298	·8774	·7294	8
9	·3992	·2571	·1137	2·9673	·8205	·6776	9
70	·3120	·1764	·0394	·8991	·7580	·6205	70
1	·2193	·0904	2·9598	·8258	·6906	·5586	1
2	·1230	·0008	·8767	·7490	·6199	·4935	2
3	·0258	2·9101	·7924	·6709	·5477	·4269	3
4	2·9305	·8211	·7096	·5941	·4767	·3613	4
75	·8378	·7346	·6291	·5194	·4077	·2976	75
6	———	·6453	·5458	·4420	·3360	·2312	6
7	6·4466	———	·4607	·3629	·2625	·1631	7
8	·2927	6·1175	———	·2810	·1863	·0923	8
9	·1476	5·9664	5·7949	———	·1059	·0173	9
80	·0123	·8255	·6483	5·4798	———	1·9393	80
1	5·8884	·6962	·5136	·3397	5·1764	———	1
2	·7766	·5795	·3920	·2131	·0448	4·8894	2
3	·6749	·4733	·2812	·0976	4·9248	·7650	3
4	·5827	·3769	·1806	4·9928	·8158	·6519	4
85	·4961	·2863	·0859	·8941	·7131	·5454	85
6	·4111	·1971	4·9926	·7966	·6115	·4399	6
7	·3250	·1066	·8975	·6970	·5074	·3316	7
8	·2384	·0152	·8012	·5957	·4012	·2206	8
9	·1476	4·9191	·6996	·4883	·2880	·1018	9
90	·0570	·8229	·5976	·3801	·1733	3·9808	90
1	4·9732	·7337	·5026	·2789	·0657	·8668	1
2	·8969	·6524	·4159	·1862	3·9665	·7612	2
3	·8278	·5785	·3369	·1015	·8756	·6637	3
4	·7707	·5174	·2715	·0311	·7997	·5820	4
95	·7264	·4699	·2205	3·9762	·7403	·5177	95
6	·6950	·4362	·1843	·9371	·6979	·4716	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴹ.

3½ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
55	2·9637	2·7974	2·6471	2·5063	2·3650	2·2141	55
6	·9456	·7812	·6326	·4934	·3537	·2042	6
7	·9260	·7636	·6169	·4793	·3412	·1934	7
8	·9046	·7444	·5997	·4639	·3276	·1816	8
9	·8813	·7234	·5807	·4469	·3125	·1683	9
60	·8561	·7007	·5602	·4285	·2961	·1540	60
1	·8292	·6764	·5383	·4088	·2785	·1385	1
2	·8006	·6506	·5150	·3878	·2598	·1220	2
3	·7706	·6236	·4906	·3658	·2401	·1048	3
4	·7394	·5954	·4652	·3430	·2198	·0869	4
65	·7064	·5656	·4384	·3190	·1984	·0682	65
6	·6712	·5339	·4097	·2932	·1756	·0482	6
7	·6330	·4993	·3786	·2652	·1507	·0265	7
8	·5911	·4614	·3442	·2343	·1231	·0024	8
9	·5439	·4183	·3050	·1988	·0913	1·9743	9
70	·4917	·3706	·2614	·1591	·0555	·9425	70
1	·4349	·3185	·2135	·1153	·0158	·9071	1
2	·3749	·2633	·1627	·0686	1·9732	·8688	2
3	·3135	·2066	·1103	·0204	·9292	·8292	3
4	·2529	·1507	·0586	1·9728	·8857	·7900	4
75	·1940	·0963	·0084	·9265	·8435	·7521	75
6	·1325	·0393	1·9556	·8778	·7989	·7119	6
7	·0693	1·9806	·9011	·8273	·7526	·6700	7
8	·0034	·9193	·8440	·7743	·7037	·6257	8
9	1·9334	·8540	·7829	·7172	·6508	·5773	9
80	·8604	·7855	·7186	.6569	·5946	·5256	80
1	·7871	·7166	·6538	·5959	·5375	·4727	1
2	———	·6511	·5919	·5376	·4828	·4220	2
3	4·6200	———	·5330	·4820	·4306	·3734	3
4	·5033	4·3673	———	·4326	·3844	·3306	4
85	·3932	·2539	4·1274	———	·3426	·2921	85
6	·2841	·1414	·0117	3·8891	———	·2537	6
7	·1718	·0255	3·8924	·7665	3·6410	———	7
8	·0565	3·9062	·7694	·6100	·5107	3·3762	8
9	3·9325	·7774	·6363	·5028	·3691	·2296	9
90	·8056	·6451	·4992	·3612	·2228	·0779	90
1	·6855	·5194	·3686	·2261	·0830	2·9328	1
2	·5737	·4018	·2460	·0990	2·9515	·7962	2
3	·4700	·2921	·1311	2·9795	·8276	·6674	3
4	·3825	·1990	·0331	·8773	·7214	·5569	4
95	·3133	·1249	2·9548	·7952	·6358	·4677	95
6	·2634	·0711	·8975	·7351	·5729	·4019	6

Age of elder Life:— { Joint Life Annuity, at Top.
{ Last Survivor Annuity, at Side.

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
55	2·0534	1·8608	1·6398	1·4102	1·1725	0·9130	55
6	·0450	·8538	·6343	·4060	·1694	·9109	6
7	·0357	·8462	·6282	·4014	·1660	·9086	7
8	·0256	·8379	·6216	·3963	·1623	·9061	8
9	·0143	·8285	·6141	·3906	·1581	·9033	9
60	·0019	·8182	·6059	·3842	·1535	·9001	60
1	1·9886	·8071	·5970	·3773	·1484	·8967	1
2	·9744	·7952	·5874	·3698	·1428	·8929	2
3	·9594	·7827	·5773	·3619	·1369	·8888	3
4	·9440	·7698	·5669	·3538	·1309	·8847	4
65	·9279	·7564	·5561	·3454	·1247	·8804	65
6	·9108	·7422	·5447	·3366	·1182	·8759	6
7	·8923	·7268	·5325	·3272	·1113	·8712	7
8	·8716	·7098	·5189	·3168	·1037	·8661	8
9	·8474	·6896	·5028	·3045	·0947	·8600	9
70	·8197	·6664	·4841	·2900	·0840	·8528	70
1	·7887	·6401	·4627	·2732	·0715	·8442	1
2	·7550	·6113	·4390	·2544	·0574	·8344	2
3	·7199	·5812	·4141	·2345	·0422	·8237	3
4	·6852	·5514	·3894	·2147	·0270	·8130	4
75	.6517	·5229	·3659	·1960	·0129	·8031	75
6	·6161	·4924	·3408	·1760	0·9977	·7924	6
7	·5790	·4606	·3146	·1552	·9819	·7814	7
8	·5396	·4267	·2865	·1329	·9650	·7696	8
9	·4962	·3891	·2551	·1077	·9458	·7561	9
80	·4494	·3481	·2206	·0796	·9242	·7407	80
1	·4013	·3056	·1844	·0498	·9008	·7239	1
2	·3549	·2644	·1491	·0206	·8778	·7071	2
3	·3103	·2246	·1147	0·9918	·8548	·6901	3
4	·2712	·1898	·0847	·9667	·8347	·6752	4
85	·2362	·1589	·0583	·9448	·8173	·6624	85
6	·2016	·1287	·0328	·9240	·8009	·6504	6
7	·1630	·0951	·0046	·9011	·7831	·6375	7
8	———	·0582	0·9742	·8771	·7652	·6253	8
9	3·0841	———	·9280	·8395	·7364	·6050	9
90	2·9259	2·7576	———	·7849	·6929	·5732	90
1	·7744	·5975	2·4099	———	·6404	·5344	1
2	·6317	·4460	·2473	2·0512	———	·4867	2
3	·4972	·3030	·0926	1·8828	1·6759	———	3
4	·3819	·1802	1·9591	·7364	·5135	1·2874	4
95	·2892	·0814	·8511	·6172	·3803	·1342	95
6	·2209	·0089	·7713	·5286	·2809	·0179	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

$3\frac{1}{2}$ PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
55	0·6535	0·4029	0·1737	55
6	·6522	·4022	·1735	6
7	·6508	·4015	·1732	7
8	·6493	·4007	·1729	8
9	·6475	·3998	·1726	9
60	·6456	·3987	·1722	60
1	·6434	·3976	·1718	1
2	·6411	·3964	·1713	2
3	·6386	·3950	·1708	3
4	·6360	·3936	·1703	4
65	·6333	·3922	·1698	65
6	·6305	·3907	·1692	6
7	·6276	·3892	·1686	7
8	·6245	·3876	·1680	8
9	·6207	·3856	·1673	9
70	·6163	·3833	·1664	70
1	·6110	·3805	·1654	1
2	·6048	·3772	·1642	2
3	·5980	·3735	·1628	3
4	·5911	·3697	·1613	4
75	·5849	·3663	·1600	75
6	·5780	·3626	·1586	6
7	·5710	·3588	·1571	7
8	·5635	·3548	·1556	8
9	·5550	·3502	·1539	9
80	·5451	·3448	·1518	80
1	·5341	·3387	·1494	1
2	·5231	·3326	·1471	2
3	·5117	·3261	·1445	3
4	·5017	·3203	·1422	4
85	·4931	·3155	·1402	85
6	·4851	·3110	·1385	6
7	·4765	·3060	·1364	7
8	·4691	·3021	·1350	8
9	·4563	·2954	·1325	9
90	·4352	·2835	·1279	90
1	·4093	·2688	·1220	1
2	·3776	·2511	·1151	2
3	·3293	·2228	·1037	3
4	——	·1839	·0874	4
95	0·9016	——	·0644	95
6	·7627	0·5260	——	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

TWO LIVES.

H^M.

FOUR PER-CENT.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives. Equal Ages.

x	$a_{x.x}$	$2a_x - a_{x.x}$	x	$a_{x.x}$	$2a_x - a_{x.x}$
10	17·8656	22·2874	55	8·2598	13·8254
1	·7637	·2011	6	7·9633	·4989
2	·6225	·1073	7	·6666	·1668
3	·4497	·0069	8	·3700	12·8292
4	·2539	21·9011	9	·0733	·4863
15	·0435	·7903	60	6·7787	·1393
6	16·8275	·6761	1	·4877	11·7889
7	·6148	·5592	2	·2013	·4355
8	·4144	·4414	3	5·9204	·0798
9	·2358	·3238	4	·6462	10·7228
20	·0809	·2067	65	·3771	·3635
1	15·9379	·0883	6	·1115	·0019
2	·8006	20·9674	7	4·8479	9·6379
3	·6599	·8423	8	·5852	·2710
4	·5088	·7120	9	·3200	8·9008
25	·3455	·5759	70	·0560	·5300
6	·1731	·4345	1	3·7962	·1612
7	14·9931	·2881	2	·5457	7·7981
8	·8104	·1370	3	·3092	·4440
9	·6262	19·9816	4	·0915	·1023
30	·4399	·8219	75	2·8928	6·7724
1	·2522	·6574	6	·7007	·4477
2	·0598	·4876	7	·5172	·1298
3	13·8622	·3122	8	·3401	5·8177
4	·6585	·1311	9	·1658	·5106
35	·4496	18·9440	80	1·9969	·2117
6	·2363	·7513	1	·8386	4·9262
7	·0200	·5528	2	·6973	·6587
8	12·8007	·3487	3	·5707	·4065
9	·5770	·1384	4	·4645	·1707
40	·3479	17·9215	85	·3732	3·9424
1	·1107	·6973	6	·2876	·7092
2	11·8635	·4653	7	·1991	·4603
3	·6073	·2257	8	·1101	·1931
4	·3447	16·9791	9	0·9952	2·8880
45	·0760	·7250	90	·8557	·5521
6	10·8052	·4648	1	·7141	·2045
7	·5339	·1987	2	·5724	1·8442
8	·2618	15·9262	3	·4148	·4596
9	9·9873	·6473	4	·2639	·0727
50	·7103	·3617	95	·1308	0·6904
1	·4288	·0688	6	·0324	·3208
2	·1412	14·7682			
3	8·8495	·4605			
4	·5557	·1461			

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
10	—	17·8140	17·7413	17·6511	17·5476	17·4348	10
1	22·2449	—	·6923	·6035	·5015	·3901	1
2	·2001	22·1550	—	·5353	·4348	·3251	2
3	·1537	·1072	22·0579	—	·3509	·2429	3
4	·1064	·0584	·0076	21·9549	—	·1478	4
15	·0586	·0092	21·9567	·9023	21·8466	—	15
6	·0111	21·9603	·9062	·8500	·7925	21·7341	6
7	21·9642	·9119	·8563	·7983	·7389	·6787	7
8	·9188	·8649	·8077	·7480	·6868	·6246	8
9	·8747	·8197	·7608	·6994	·6365	·5725	9
20	·8324	·7758	·7156	·6526	·5879	·5221	20
1	·7909	·7332	·6714	·6068	·5404	·4728	1
2	·7501	·6909	·6278	·5615	·4935	·4242	2
3	·7093	·6487	·5841	·5163	·4465	·3755	3
4	·6681	·6064	·5401	·4707	·3993	·3264	4
25	·6267	·5635	·4959	·4249	·3516	·2770	25
6	·5852	·5208	·4516	·3790	·3039	·2274	6
7	·5437	·4781	·4074	·3330	·2564	·1779	7
8	·5024	·4354	·3634	·2874	·2088	·1286	8
9	·4615	·3933	·3197	·2422	·1619	·0798	9
30	·4211	·3516	·2765	·1974	·1155	·0315	30
1	·3808	·3102	·2338	·1530	·0693	20·9836	1
2	·3408	·2689	·1912	·1089	·0234	·9359	2
3	·3011	·2280	·1488	·0650	20·9778	·8884	3
4	·2614	·1873	·1067	·0213	·9325	·8413	4
35	·2220	·1466	·0648	20·9778	·8873	·7945	35
6	·1830	·1066	·0233	·9349	·8427	·7480	6
7	·1443	·0668	20·9823	·8922	·7985	·7020	7
8	·1060	·0275	·9416	·8502	·7546	·6565	8
9	·0682	20·9884	·9014	·8084	·7114	·6114	9
40	·0306	·9499	·8615	·7671	·6685	·5668	40
1	20·9933	·9116	·8220	·7261	·6258	·5225	1
2	·9562	·8735	·7826	·6854	·5834	·4784	2
3	·9194	·8359	·7437	·6450	·5416	·4347	3
4	·8832	·7986	·7055	·6052	·5002	·3917	4
45	·8474	·7619	·6674	·5659	·4592	·3490	45
6	·8123	·7260	·6303	·5273	·4192	·3073	6
7	·7779	·6907	·5939	·4896	·3798	·2664	7
8	·7442	·6562	·5583	·4526	·3414	·2262	8
9	·7113	·6224	·5234	·4164	·3036	·1869	9
50	·6790	·5894	·4893	·3810	·2668	·1484	50
1	·6475	·5571	·4559	·3463	·2306	·1107	1
2	·6165	·5255	·4233	·3124	·1952	·0737	2
3	·5864	·4946	·3914	·2792	·1606	·0375	3
4	·5571	·4645	·3603	·2469	·1269	·0023	4

 Age of elder Life:— { Joint Life Annuity, at Top.
{ Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
10	17·3172	17·1993	17·0856	16·9816	16·8879	16·7987	10
1	·2739	·1575	·0454	·9425	·8504	·7623	1
2	·2105	·0956	16·9851	·8839	·7931	·7066	2
3	·1301	·0170	·9082	·8087	·7195	·6346	3
4	·0368	16·9256	·8186	·7208	·6334	·5502	4
15	16·9346	·8252	·7202	·6242	·5386	·4572	15
6	———	·7202	·6171	·5230	·4392	·3596	6
7	21·6186	———	·5137	·4215	·3395	·2617	7
8	·5626	21·5012	———	·3242	·2440	·1680	8
9	·5086	·4453	21·3835	———	·1575	·0833	9
20	·4564	·3913	·3277	21·2661	———	·0086	20
1	·4053	·3384	·2730	·2096	21·1483	———	1
2	·3549	·2861	·2189	·1537	·0906	21·0287	2
3	·3043	·2337	·1646	·0977	·0328	20·9690	3
4	·2535	·1809	·1099	·0411	20·9744	·9088	4
25	·2021	·1277	·0547	20·9840	·9154	·8479	25
6	·1506	·0742	20·9994	·9267	·8561	·7867	6
7	·0992	·0209	·9440	·8694	·7969	·7255	7
8	·0480	20·9677	·8889	·8123	·7379	·6645	8
9	20·9973	·9151	·8343	·7558	·6794	·6040	9
30	·9470	·8629	·7801	·6997	·6214	·5441	30
1	·8972	·8111	·7264	·6441	·5639	·4847	1
2	·8477	·7597	·6730	·5887	·5067	·4255	2
3	·7984	·7085	·6199	·5337	·4498	·3667	3
4	·7493	·6575	·5671	·4790	·3932	·3083	4
35	·7006	·6068	·5146	·4247	·3371	·2502	35
6	·6524	·5568	·4625	·3708	·2814	·1928	6
7	·6045	·5071	·4110	·3174	·2263	·1359	7
8	·5572	·4579	·3601	·2647	·1717	·0795	8
9	·5104	·4093	·3096	·2125	·1179	·0239	9
40	.4639	·3610	·2596	·1607	·0644	19·9688	40
1	·4179	·3131	·2099	·1094	·0114	·9142	1
2	·3719	·2655	·1605	·0583	19·9587	·8598	2
3	·3265	·2182	·1116	·0077	·9066	·8061	3
4	·2817	·1717	·0632	19·9577	·8551	·7531	4
45	·2374	·1255	·0155	·9083	·8041	·7007	45
6	·1939	·0804	19·9686	·8599	·7543	·6493	6
7	·1513	·0361	·9227	·8124	·7054	·5990	7
8	·1094	19·9926	·8775	·7658	·6574	·5498	8
9	·0685	·9500	·8334	·7202	·6105	·5015	9
50	·0284	·9082	·7901	·6755	·5645	·4543	50
1	19·9890	·8673	·7475	·6316	·5193	·4079	1
2	·9504	·8270	·7059	·5885	·4751	·3625	2
3	·9126	·7877	·6650	·5464	·4317	·3181	3
4	·8758	·7493	·6251	·5052	·3894	·2747	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
10	16·7104	16·6183	16·5188	16·4105	16·2951	16·1734	10
1	·6755	·5848	·4864	·3796	·2654	·1449	1
2	·6211	·5319	·4352	·3297	·2171	·0981	2
3	·5508	·4631	·3680	·2641	·1531	·0359	3
4	·4680	·3821	·2886	·1866	·0774	15·9617	4
15	·3767	·2925	·2009	·1006	15·9933	·8796	15
6	·2809	·1986	·1087	·0104	·9050	·7932	6
7	·1849	·1044	·0165	15·9200	·8166	·7067	7
8	·0930	·0144	15·9284	·8339	·7323	·6245	8
9	·0101	15·9332	·8491	·7565	·6569	·5510	9
20	15·9372	·8621	·7798	·6891	·5915	·4875	20
1	·8684	·7952	·7147	·6259	·5302	·4282	1
2	———	·7293	·6508	·5640	·4702	·3702	2
3	20·9058	———	·5834	·4986	·4069	·3089	3
4	·8436	20·7781	———	·4262	·3366	·2408	4
25	·7807	·7132	20·6449	———	·2583	·1647	25
6	·7176	·6480	·5776	20·5062	———	·0820	6
7	·6544	·5828	·5102	·4366	20·3624	———	7
8	·5914	·5177	·4429	·3671	·2905	20·2137	8
9	·5290	·4531	·3762	·2980	·2192	·1398	9
30	·4670	·3892	·3100	·2295	·1482	·0665	30
1	·4055	·3256	·2443	·1615	·0778	19·9935	1
2	·3445	·2624	·1789	·0938	·0076	·9208	2
3	·2837	·1996	·1139	·0264	19·9379	·8485	3
4	·2233	·1371	·0493	19·9595	·8685	·7766	4
35	·1633	·0751	19·9851	·8930	·7995	·7051	35
6	·1039	·0137	·9215	·8272	·7313	·6343	6
7	·0452	19·9529	·8586	·7621	·6638	·5643	7
8	19·9871	·8930	·7965	·6977	·5971	·4950	8
9	·9296	·8337	·7352	·6341	·5311	·4266	9
40	·8728	·7749	·6745	·5713	·4659	·3590	40
1	·8165	·7167	·6143	·5090	·4014	·2920	1
2	·7604	·6590	·5546	·4472	·3374	·2256	2
3	·7050	·6019	·4957	·3861	·2741	·1599	3
4	·6505	·5455	·4375	·3260	·2118	·0953	4
45	·5965	·4900	·3801	·2667	·1504	·0316	45
6	·5438	·4357	·3241	·2086	·0903	18·9694	6
7	·4920	·3825	·2692	·1520	·0315	·9086	7
8	·4414	·3303	·2154	·0965	18·9742	·8490	8
9	·3918	·2794	·1629	·0422	·9181	·7910	9
50	·3433	·2295	·1115	18·9892	·8633	·7342	50
1	·2958	·1806	·0612	·9373	·8096	·6787	1
2	·2491	·1328	·0120	·8865	·7571	·6244	2
3	·2036	·0860	18·9639	·8370	·7059	·5714	3
4	·1592	·0404	·9171	·7886	·6561	·5199	4

 Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

H[M].

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
10	16·0478	15·9189	15·7863	15·6505	15·5094	15·3626	10
1	·0207	·8930	·7617	·6270	·4872	·3416	1
2	15·9752	·8491	·7193	·5859	·4474	·3033	2
3	·9146	·7900	·6618	·5301	·3931	·2505	3
4	·8424	·7195	·5929	·4630	·3278	·1869	4
15	·7620	·6410	·5163	·3881	·2547	·1157	15
6	·6775	·5584	·4357	·3094	·1778	·0406	6
7	·5930	·4758	·3550	·2307	·1010	14·9657	7
8	·5127	·3975	·2787	·1563	·0286	·8952	8
9	·4412	·3279	·2110	·0905	14·9648	·8333	9
20	·3796	·2683	·1533	·0347	·9108	·7812	20
1	·3223	·2130	·0999	14·9832	·8613	·7336	1
2	·2663	·1589	·0479	·9333	·8132	·6875	2
3	·2071	·1019	14·9928	·8803	·7624	·6387	3
4	·1412	·0381	·9313	·8209	·7052	·5837	4
25	·0673	14·9666	·8621	·7540	·6406	·5215	25
6	14·9870	·8885	·7865	·6808	·5699	·4531	6
7	·9006	·8047	·7050	·6019	·4935	·3793	7
8	——	·7171	·6200	·5194	·4136	·3020	8
9	20·0605	——	·5318	·4338	·3307	·2218	9
30	19·9846	19·9030	——	·3447	·2443	·1382	30
1	·9091	·8249	19·7410	——	·1545	·0513	1
2	·8338	·7469	·6603	19·5740	——	13·9595	2
3	·7589	·6693	·5799	·4907	19·4014	——	3
4	·6843	·5920	·4998	·4077	·3154	19·2232	4
35	·6102	·5151	·4200	·3250	·2298	·1345	35
6	·5367	·4390	·3411	·2431	·1448	·0464	6
7	·4640	·3635	·2628	·1619	·0605	18·9589	7
8	·3922	·2889	·1854	·0816	18·9772	·8724	8
9	·3212	·2153	·1089	·0021	·8946	·7867	9
40	·2510	·1424	·0332	18·9235	·8130	·7018	40
1	·1814	·0701	18·9582	·8456	·7320	·6177	1
2	·1125	18·9985	·8838	·7684	·6518	·5342	2
3	·0444	·9278	·8104	·6920	·5724	·4518	3
4	18·9773	·8583	·7381	·6169	·4943	·3706	4
45	·9113	·7896	·6669	·5429	·4174	·2905	45
6	·8467	·7227	·5973	·4707	·3423	·2124	6
7	·7836	·6572	·5294	·4001	·2690	·1361	7
8	·7219	·5933	·4630	·3312	·1972	·0615	8
9	·6617	·5308	·3982	·2639	·1274	17·9888	9
50	·6029	·4698	·3349	·1982	·0591	·9179	50
1	·5455	·4102	·2731	·1341	17·9925	·8486	1
2	·4892	·3520	·2127	·0714	·9275	·7810	2
3	·4344	·2952	·1540	·0105	·8642	·7152	3
4	·3810	·2400	·0967	17·9512	·8027	·6513	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
10	15·2099	15·0513	14·8873	14·7186	14·5452	14·3660	10
1	·1899	·0326	·8696	·7020	·5296	·3517	1
2	·1530	14·9969	·8354	·6690	·4980	·3212	2
3	·1018	·9473	·7872	·6225	·4528	·2776	3
4	·0398	·8870	·7286	·5654	·3976	·2238	4
15	14·9704	·8192	·6627	·5013	·3351	·1632	15
6	·8973	·7480	·5932	·4337	·2693	·0991	6
7	·8243	·6770	·5240	·3663	·2038	·0354	7
8	·7556	·6101	·4592	·3033	·1425	13·9760	8
9	·6956	·5519	·4028	·2488	·0898	·9250	9
20	·6454	·5035	·3562	·2039	·0468	·8836	20
1	·5996	·4597	·3141	·1636	·0083	·8469	1
2	·5555	·4175	·2739	·1252	13·9716	·8121	2
3	·5088	·3728	·2312	·0846	·9328	·7751	3
4	·4559	·3221	·1827	·0382	·8886	·7329	4
25	·3960	·2645	·1273	13·9850	·8377	·6843	25
6	·3301	·2011	·0663	·9264	·7814	·6304	6
7	·2588	·1323	·0001	·8627	·7203	·5717	7
8	·1842	·0603	13·9308	·7961	·6562	·5102	8
9	·1067	13·9856	·8587	·7268	·5897	·4463	9
30	·0259	·9077	·7836	·6545	·5202	·3797	30
1	13·9419	·8266	·7055	·5793	·4479	·3104	1
2	·8531	·7407	·6227	·4996	·3712	·2368	2
3	·7588	·6495	·5346	·4147	·2895	·1582	3
4	—	·5524	·4408	·3241	·2022	·0742	4
35	19·0392	—	·3412	·2279	·1094	12·9848	35
6	18·9478	18·8494	—	·1264	·0114	·8903	6
7	·8571	·7553	18·6538	—	12·9085	·7911	7
8	·7673	·6621	·5571	18·4526	—	·6870	8
9	·6783	·5697	·4612	·3530	18·2454	—	9
40	·5901	·4780	·3660	·2542	·1428	18·0319	40
1	·5026	·3871	·2715	·1559	·0407	17·9259	1
2	·4159	·2968	·1776	·0583	17·9392	·8204	2
3	·3300	·2075	·0846	17·9616	·8386	·7158	3
4	·2455	·1195	17·9931	·8662	·7393	·6125	4
45	·1623	·0329	·9028	·7722	·6414	·5105	45
6	·0809	17·9482	·8145	·6802	·5456	·4106	6
7	·0014	·8654	·7283	·5903	·4519	·3129	7
8	17·9238	·7845	·6440	·5025	·3603	·2174	8
9	·8482	·7057	·5618	·4167	·2709	·1241	9
50	·7743	·6287	·4816	·3331	·1835	·0330	50
1	·7022	·5536	·4033	·2515	·0984	16·9440	1
2	·6318	·4803	·3268	·1718	·0152	·8572	2
3	·5634	·4090	·2525	·0942	16·9343	·7727	3
4	·4969	·3398	·1804	·0190	·8558	·6967	4

[224] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
10	14·1806	13·9872	13·7847	13·5736	13·3552	13·1296	10
1	·1672	·9748	·7733	·5630	·3457	·1210	1
2	·1381	·9469	·7467	·5377	·3213	·0980	2
3	·0959	·9062	·7073	·4998	·2850	·0629	3
4	·0437	·8557	·6585	·4524	·2392	·0188	4
15	13·9848	·7984	·6029	·3987	·1871	12·9684	15
6	·9226	·7379	·5443	·3418	·1320	·9149	6
7	·8607	·6779	·4859	·2853	·0772	·8620	7
8	·8030	·6220	·4318	·2328	·0266	·8129	8
9	·7538	·5744	·3859	·1886	12·9840	·7720	9
20	·7141	·5364	·3495	·1537	·9506	·7402	20
1	·6790	·5029	·3177	·1235	·9219	·7129	1
2	·6459	·4715	·2880	·0955	·8954	·6880	2
3	·6109	·4384	·2565	·0657	·8675	·6616	3
4	·5706	·4001	·2202	·0312	·8348	·6308	4
25	·5241	·3557	·1779	12·9911	·7966	·5945	25
6	·4726	·3064	·1308	·9462	·7539	·5539	6
7	·4163	·2526	·0794	·8972	·7072	·5095	7
8	·3574	·1963	·0256	·8458	·6583	·4629	8
9	·2962	·1378	12·9698	·7926	·6075	·4148	9
30	·2324	·0767	·9115	·7370	·5547	·3645	30
1	·1660	·0132	·8508	·6793	·4998	·3124	1
2	·0954	12·9457	·7863	·6178	·4413	·2568	2
3	·0201	·8735	·7174	·5519	·3785	·1972	3
4	12·9394	·7962	·6433	·4813	·3112	·1330	4
35	·8535	·7137	·5644	·4058	·2392	·0644	35
6	·7625	·6263	·4806	·3257	·1626	11·9915	6
7	·6669	·5345	·3925	·2413	·0821	·9147	7
8	·5666	·4380	·2999	·1526	11·9973	·8338	8
9	·4605	·3358	·2017	·0584	·9071	·7477	9
40	———	·2272	·0972	11·9581	·8110	·6557	40
1	17·8115	———	11·9849	·8501	·7073	·5565	1
2	·7019	17·5835	———	·7331	·5948	·4485	2
3	·5931	·4704	17·3178	———	·4736	·3320	3
4	·4856	·3586	·2315	17·1048	———	·2079	4
45	·3795	·2480	·1164	16·9850	16·8545	———	45
6	·2753	·1396	·0033	·8673	·7319	16·5974	6
7	·1734	·0333	16·8926	·7517	·6115	·4720	7
8	·0738	16·9293	·7840	·6385	·4934	·3188	8
9	16·9764	·8277	·6778	·5276	·3776	·2280	9
50	·8813	·7283	·5740	·4190	·2641	·1095	50
1	·7884	·6311	·4724	·3128	·1530	15·9933	1
2	·6976	·5363	·3732	·2089	·0444	·8795	2
3	·6093	·4439	·2765	·1077	15·9383	·7686	3
4	·5236	·3512	·1826	·0093	·8352	·6605	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴹ.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
10	12·8992	12·6649	12·4263	12·1825	11·9335	11·6778	10
1	·8914	·6580	·4202	·1773	·9290	·6741	1
2	·8696	·6373	·4006	·1588	·9116	·6578	2
3	·8360	·6050	·3697	·1292	·8833	·6308	3
4	·7933	·5640	·3301	·0912	·8467	·5957	4
15	·7446	·5168	·2847	·0473	·8045	·5550	15
6	·6929	·4668	·2364	·0006	·7594	·5116	6
7	·6416	·4172	·1884	11·9543	·7148	·4685	7
8	·5943	·3715	·1444	·9118	·6738	·4292	8
9	·5549	·3337	·1080	·8769	·6403	·3970	9
20	·5245	·3047	·0804	·8506	·6153	·3733	20
1	·4988	·2804	·0573	·8289	·5948	·3540	1
2	·4752	·2583	·0366	·8095	·5767	·3370	2
3	·4504	·2349	·0148	·7890	·5576	·3193	3
4	·4213	·2075	11·9890	·7648	·5349	·2980	4
25	·3871	·1750	·9582	·7358	·5075	·2722	25
6	·3485	·1386	·9236	·7030	·4765	·2430	6
7	·3062	·0983	·8856	·6669	·4424	·2107	7
8	·2620	·0564	·8458	·6293	·4068	·1770	8
9	·2162	·0130	·8046	·5904	·3701	·1425	9
30	·1686	11·9678	·7619	·5500	·3320	·1066	30
1	·1191	·9210	·7176	·5082	·2926	·0695	1
2	·0664	·8710	·6705	·4636	·2506	·0300	2
3	·0098	·8174	·6197	·4157	·2053	10·9874	3
4	11·9489	·7597	·5650	·3639	·1565	·9414	4
35	·8836	.6977	·5063	·3084	·1041	·8920	35
6	·8143	·6318	·4438	·2493	·0482	·8393	6
7	·7412	·5624	·3779	·1870	10·9893	·7837	7
8	·6641	·4891	·3084	·1211	·9272	·7251	8
9	·5821	·4111	·2343	·0509	·8607	·6625	9
40	·4944	·3276	·1549	10·9756	·7894	·5951	40
1	·3994	·2370	·0687	·8936	·7117	·5217	1
2	·2961	·1381	10·9744	·8039	·6264	·4408	2
3	·1842	·0311	·8720	·7062	·5335	·3525	3
4	·0650	10·9167	·7625	·6016	·4338	·2577	4
45	10·9381.	·7948	·6457	·4898	·3270	·1560	45
6	—	·6670	·5230	·3723	·2147	·0489	6
7	16·3343	—	·3952	·2498	·0976	9·9371	7
8	·2060	16·0651	—	·1218	9·9750	·8200	8
9	·0800	15·9338	15·7895	—	·8460	·6966	9
50	15·9563	·8047	·6550	15·5073	—	·5666	50
1	·8349	·6780	·5228	·3695	15·2182	—	1
2	·7159	·5537	·3930	·2340	·0768	14·9216	2
3	·5997	·4321	·2659	·1012	14·9382	·7770	3
4	·4866	·3136	·1419	14·9716	·8028	·6355	4

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

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4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
10	11·4147	11·1451	10·8703	10·5905	10·3065	10·0186	10
1	·4116	·1428	·8688	·5895	·3061	·0189	1
2	·3963	·1285	·8555	·5772	·2948	·0085	2
3	·3706	·1041	·8323	·5553	·2741	9·9890	3
4	·3370	·0719	·8015	·5260	·2462	·9625	4
15	·2979	·0344	·7655	·4915	·2132	·9309	15
6	·2561	10·9942	·7269	·4544	·1777	·8969	6
7	·2147	·9543	·6886	·4177	·1424	·8632	7
8	·1767	·9179	·6537	·3842	·1103	·8324	8
9	·1460	·8884	·6255	·3573	·0847	·8080	9
20	·1234	·8671	·6053	·3381	·0666	·7909	20
1	·1053	·8500	·5893	·3232	·0526	·7779	1
2	·0896	·8354	·5757	·3107	·0410	·7672	2
3	·0730	·8201	·5616	·2975	·0290	·7562	3
4	·0531	·8015	·5442	·2814	·0140	·7423	4
25	·0289	·7787	·5230	·2615	9·9954	·7249	25
6	·0014	·7529	·4986	·2387	·9740	·7050	6
7	10·9709	·7242	·4716	·2133	·9503	·6827	7
8	·9392	·6943	·4436	·1870	·9255	·6595	8
9	·9066	·6637	·4148	·1600	·9003	·6359	9
30	·8729	·6319	·3851	·1322	·8742	·6117	30
1	·8381	·5993	·3545	·1036	·8476	·5868	1
2	·8009	·5645	·3219	·0731	·8192	·5604	2
3	·7609	·5270	·2868	·0404	·7886	·5319	3
4	·7177	·4864	·2488	·0048	·7554	·5009	4
35	·6712	·4428	·2079	9·9665	·7197	·4677	35
6	·6217	·3963	·1643	·9258	·6816	·4322	6
7	·5693	·3472	·1183	·8828	·6415	·3948	7
8	·5142	·2954	·0698	·8374	·5993	·3555	8
9	·4552	·2400	·0179	·7890	·5540	·3134	9
40	·3918	·1804	9·9620	·7366	·5052	·2679	40
1	·3224	·1151	·9007	·6791	·4514	·2177	1
2	·2459	·0429	·8327	·6153	·3915	·1617	2
3	·1623	9·9638	·7581	·5451	·3256	·0999	3
4	·0722	·8786	·6776	·4692	·2542	·0330	4
45	9·9757	·7869	·5909	·3873	·1772	8·9606	45
6	·8738	·6903	·4993	·3009	·0957	·8839	6
7	·7673	·5892	·4036	·2103	·0103	·8036	7
8	·6557	·4831	·3030	·1152	8·9205	·7191	8
9	·5380	·3711	·1966	·0144	·8254	·6294	9
50	·4139	·2528	·0841	8·9078	·7244	·5343	50
1	·2819	·1268	8·9642	·7939	·6165	·4323	1
2	———	8·9922	·8358	·6717	·5006	·3224	2
3	14·6175	———	·6994	·5416	·3769	·2052	3
4	·4698	14·3065	———	·4044	·2462	·0810	4

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
10	9·7272	9·4321	9·1350	8·8369	8·5385	8·2409	10
1	·7280	·4335	·1369	·8392	·5413	·2440	1
2	·7186	·4248	·1291	·8322	·5350	·2385	2
3	·7002	·4077	·1130	·8172	·5211	·2256	3
4	·6750	·3838	·0904	·7959	·5011	·2068	4
15	·6450	·3552	·0633	·7702	·4767	·1837	15
6	·6125	·3243	·0338	·7421	·4500	·1584	6
7	·5802	·2934	·0043	·7140	·4233	·1330	7
8	·5508	·2653	8·9776	·6885	·3990	·1099	8
9	·5275	·2432	·9565	·6685	·3801	·0920	9
20	·5114	·2280	·9422	·6551	·3675	·0801	20
1	·4993	·2167	·9318	·6454	·3585	·0719	1
2	·4895	·2077	·9236	·6379	·3517	·0657	2
3	·4793	·1985	·9151	·6303	·3448	·0594	3
4	·4666	·1867	·9043	·6203	·3357	·0512	4
25	·4504	·1717	·8904	·6075	·3238	·0402	25
6	·4317	·1543	·8742	·5924	·3098	·0272	6
7	·4109	·1347	·8559	·5754	·2940	·0125	7
8	·3892	·1145	·8370	·5579	·2777	7·9973	8
9	·3672	·0940	·8180	·5400	·2612	·9821	9
30	·3445	·0730	·7984	·5220	·2443	·9665	30
1	·3215	·0516	·7786	·5036	·2274	·9509	1
2	·2969	·0288	·7575	·4841	·2094	·9343	2
3	·2704	·0041	·7347	·4630	·1900	·9164	3
4	·2417	8·9775	·7099	·4401	·1688	·8969	4
35	·2107	·9487	·6833	·4155	·1461	·8759	35
6	·1777	·9181	·6549	·3892	·1218	·8535	6
7	·1430	·8859	·6251	·3617	·0964	·8302	7
8	·1065	·8520	·5938	·3328	·0698	·8057	8
9	·0673	·8158	·5603	·3019	·0413	·7796	9
40	·0251	·7766	·5241	·2685	·0106	·7513	40
1	8·9783	·7333	·4839	·2313	7·9763	·7198	1
2	·9261	·6846	·4388	·1895	·9376	·6841	2
3	·8683	·6307	·3886	·1429	·8944	·6441	3
4	·8056	·5721	·3340	·0921	·8473	·6005	4
45	·7378	·5086	·2747	·0369	·7960	·5529	45
6	·6659	·4414	·2118	7·9783	·7415	·5024	6
7	·5905	·3708	·1460	·9169	·6845	·4494	7
8	·5111	·2965	·0766	·8522	·6243	·3936	8
9	·4269	·2175	·0027	·7833	·5602	·3341	9
50	·3373	·1334	7·9240	·7099	·4918	·2706	50
1	·2412	·0431	·8393	·6307	·4179	·2019	1
2	·1374	7·9454	·7475	·5447	·3376	·1269	2
3	·0265	·8407	·6490	·4522	·2510	·0461	3
4	7·9088	·7295	·5441	·3536	·1585	6·9596	4

 Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
10	7·9447	7·6489	7·3528	7·0554	6·7563	6·4533	10
1	·9482	·6528	·3570	·0599	·7610	·4582	1
2	·9434	·6487	·3536	·0571	·7587	·4565	2
3	·9314	·6377	·3435	·0479	·7505	·4490	3
4	·9138	·6212	·3281	·0337	·7373	·4369	4
15	·8920	·6007	·3088	·0156	·7204	·4212	15
6	·8681	·5780	·2874	6·9954	·7015	·4035	6
7	·8439	·5551	·2658	·9750	·6822	·3854	7
8	·8220	·5343	·2461	·9564	·6646	·3689	8
9	·8050	·5183	·2309	·9421	·6512	·3562	9
20	·7939	·5079	·2212	·9330	·6427	·3484	20
1	·7863	·5009	·2147	·9271	·6373	·3434	1
2	·7807	·4959	·2103	·9231	·6338	·3403	2
3	·7751	·4909	·2058	·9191	·6303	·3373	3
4	·7676	·4840	·1997	·9136	·6253	·3328	4
25	·7575	·4748	·1911	·9058	·6183	·3264	25
6	·7455	·4636	·1809	·8964	·6096	·3185	6
7	·7318	·4510	·1692	·8856	·5997	·3094	7
8	·7178	·4380	·1572	·8745	·5895	·3000	8
9	·7036	·4249	·1451	·8634	·5793	·2907	9
30	·6893	·4117	·1330	·8522	·5690	·2813	30
1	·6749	·3985	·1208	·8412	·5589	·2721	1
2	·6596	·3844	·1080	·8294	·5482	·2623	2
3	·6431	·3693	·0941	·8167	·5366	·2518	3
4	·6252	·3528	·0789	·8028	·5239	·2402	4
35	·6059	·3350	·0626	·7879	·5103	·2278	35
6	·5853	·3162	·0453	·7721	·4959	·2147	6
7	·5638	·2965	·0274	·7557	·4809	·2011	7
8	·5414	·2760	·0086	·7387	·4655	·1872	8
9	·5175	·2541	6·9887	·7205	·4490	·1723	9
40	·4916	·2304	·9671	·7009	·4312	·1563	40
1	·4626	·2039	·9429	·6788	·4112	·1381	1
2	·4297	·1736	·9152	·6535	·3882	·1172	2
3	·3928	·1397	·8839	·6249	·3620	·0934	3
4	·3525	·1025	·8497	·5934	·3332	·0672	4
45	·3084	·0618	·8122	·5590	·3016	·0383	45
6	·2617	·0186	·7724	·5224	·2682	·0077	6
7	·2126	6·9733	·7308	·4842	·2331	5·9757	7
8	·1610	·9256	·6868	·4439	·1962	·9421	8
9	·1059	·8748	·6400	·4009	·1569	·9062	9
50	·0470	·8204	·5899	·3548	·1147	·8677	50
1	6·9833	·7613	·5354	·3047	·0688	·8258	1
2	·9136	·6968	·4757	·2497	·0182	·7795	2
3	·8383	·6268	·4109	·1898	5·9631	·7290	3
4	·7576	·5517	·3413	·1255	·9038	·6745	4

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
10	6·1498	5·8484	5·5535	5·2691	4·9993	4·7440	10
1	·1548	·8535	·5586	·2743	5·0044	·7491	1
2	·1536	·8528	·5583	·2743	·0048	·7498	2
3	·1469	·8469	·5531	·2698	·0008	·7464	3
4	·1358	·8367	·5438	·2614	4·9932	·7395	4
15	·1213	·8232	·5314	·2499	·9827	·7298	15
6	·1047	·8078	·5171	·2366	·9704	·7184	6
7	·0877	·7920	·5023	·2228	·9575	·7064	7
8	·0722	·7774	·4887	·2101	·9456	·6953	8
9	·0603	·7663	·4783	·2004	·9365	·6868	9
20	·0531	·7596	·4720	·1946	·9311	·6817	20
1	·0485	·7554	·4683	·1911	·9280	·6789	1
2	·0458	·7530	·4662	·1893	·9264	·6775	2
3	·0432	·7508	·4643	·1877	·9251	·6764	3
4	·0392	·7473	·4612	·1851	·9227	·6744	4
25	·0334	·7421	·4565	·1808	·9190	·6710	25
6	·0263	·7356	·4506	·1755	·9141	·6666	6
7	·0179	·7279	·4436	·1691	·9083	·6613	7
8	·0093	·7201	·4365	·1626	·9023	·6559	8
9	·0008	·7123	·4294	·1561	·8964	·6505	9
30	5·9922	·7045	·4223	·1497	·8906	·6452	30
1	·9839	·6969	·4154	·1435	·8850	·6402	1
2	·9750	·6889	·4082	·1369	·8790	·6348	2
3	·9654	·6802	·4003	·1298	·8726	·6290	3
4	·9550	·6707	·3917	·1220	·8656	·6226	4
35	·9437	·6605	·3825	·1137	·8580	·6157	35
6	·9318	·6497	·3727	·1048	·8500	·6085	6
7	·9195	·6386	·3627	·0958	·8419	·6012	7
8	·9068	·6273	·3525	·0866	·8336	·5938	8
9	·8935	·6152	·3417	·0770	·8250	·5860	9
40	·8790	·6023	·3301	·0666	·8157	·5777	40
1	·8627	·5875	·3169	·0547	·8051	·5683	1
2	·8437	·5704	·3014	·0409	·7926	·5570	2
3	·8221	·5508	·2837	·0248	·7782	·5440	3
4	·7982	·5292	·2641	·0071	·7621	·5294	4
45	·7719	·5053	·2424	4·9874	·7442	·5132	45
6	·7440	·4799	·2193	·9665	·7253	·4961	6
7	·7149	·4535	·1954	·9448	·7056	·4783	7
8	·6843	·4257	·1703	·9221	·6851	·4597	8
9	·6517	·3961	·1435	·8978	·6632	·4400	9
50	·6167	·3644	·1148	·8719	·6398	·4189	50
1	·5786	·3297	·0834	·8435	·6141	·3957	1
2	·5363	·2913	·0485	·8119	·5855	·3697	2
3	·4902	·2493	·0103	·7772	·5540	·3412	3
4	·4403	·2038	4·9689	·7396	·5198	·3102	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
10	4·4939	4·2507	4·0131	3·7788	3·5509	3·3344	10
1	·4989	·2557	·0180	·7836	·5555	·3388	1
2	·4998	·2568	·0193	·7850	·5570	·3404	2
3	·4969	·2543	·0172	·7833	·5537	·3393	3
4	·4907	·2488	·0123	·7789	·5518	·3359	4
15	·4819	·2408	·0050	·7723	·5459	·3305	15
6	·4713	·2310	3·9961	·7642	·5384	·3237	6
7	·4602	·2207	·9865	·7553	·5303	·3163	7
8	·4498	·2110	·9775	·7470	·5226	·3091	8
9	·4418	·2036	·9706	·7406	·5166	·3036	9
20	·4372	·1993	·9666	·7369	·5132	·3005	20
1	·4346	·1969	·9644	·7349	·5114	·2988	1
2	·4334	·1959	·9636	·7342	·5108	·2983	2
3	·4325	·1952	·9630	·7338	·5105	·2981	3
4	·4308	·1937	·9617	·7327	·5096	·2974	4
25	·4278	·1910	·9593	·7306	·5078	·2958	25
6	·4238	·1874	·9561	·7277	·5052	·2935	6
7	·4190	·1830	·9521	·7241	·5019	·2905	7
8	·4140	·1785	·9481	·7204	·4986	·2875	8
9	·4091	·1741	·9441	·7168	·4953	·2846	9
30	·4043	·1698	·9401	·7133	·4922	·2817	30
1	·3998	·1656	·9364	·7100	·4892	·2791	1
2	·3949	·1613	·9325	·7065	·4861	·2763	2
3	·3897	·1566	·9283	·7027	·4827	·2733	3
4	·3839	·1514	·9236	·6985	·4789	·2699	4
35	·3777	·1458	·9186	·6939	·4749	·2662	35
6	·3712	·1399	·9133	·6892	·4705	·2624	6
7	·3646	·1339	·9079	·6844	·4663	·2586	7
8	·3579	·1280	·9026	·6797	·4621	·2548	8
9	·3510	·1218	·8971	·6748	·4578	·2510	9
40	·3437	·1153	·8913	·6697	·4533	·2471	40
1	·3352	·1078	·8847	·6638	·4481	·2425	1
2	·3251	·0988	·8766	·6566	·4417	·2368	2
3	·3134	·0882	·8672	·6482	·4342	·2301	3
4	·3002	·0764	·8565	·6386	·4256	·2225	4
45	·2856	·0631	·8446	·6279	·4160	·2139	45
6	·2701	·0491	·8320	·6165	·4058	·2047	6
7	·2540	·0346	·8190	·6049	·3954	·1953	7
8	·2373	·0196	·8054	·5928	·3845	·1857	8
9	·2195	·0036	·7911	·5799	·3731	·1755	9
50	·2005	3·9865	·7758	·5663	·3609	·1647	50
1	·1796	·9677	·7590	·5512	·3475	·1527	1
2	·1562	·9466	·7400	·5343	·3324	·1392	2
3	·1303	·9233	·7190	·5154	·3155	·1241	3
4	·1022	·8979	·6962	·4949	·2971	·1077	4

 Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
10	3·1347	2·9495	2·7823	2·6259	2·4698	2·3044	10
1	·1389	·9536	·7863	·6297	·4735	·3078	1
2	·1406	·9553	·7880	·6316	·4753	·3097	2
3	·1398	·9547	·7877	·6314	·4754	·3099	3
4	·1368	·9521	·7854	·6295	·4738	·3087	4
15	·1320	·9478	·7815	·6260	·4707	·3061	15
6	·1258	·9421	·7763	·6213	·4665	·3023	6
7	·1189	·9358	·7705	·6159	·4616	·2979	7
8	·1123	·9296	·7648	·6106	·4567	·2934	8
9	·1071	·9249	·7604	·6065	·4528	·2899	9
20	·1042	·9222	·7579	·6042	·4507	·2879	20
1	·1027	·9208	·7566	·6030	·4496	·2869	1
2	·1023	·9205	·7563	·6028	·4494	·2868	2
3	·1022	·9204	·7564	·6029	·4496	·2870	3
4	·1016	·9199	·7560	·6026	·4494	·2869	4
25	·1002	·9187	·7549	·6017	·4486	·2862	25
6	·0981	·9169	·7533	·6002	·4473	·2851	6
7	·0955	·9145	·7511	·5983	·4456	·2836	7
8	·0928	·9120	·7489	·5963	·4438	·2820	8
9	·0901	·9096	·7467	·5943	·4421	·2805	9
30	·0875	·9073	·7446	·5925	·4404	·2790	30
1	·0852	·9052	·7427	·5908	·4389	·2777	1
2	·0827	·9030	·7408	·5890	·4374	·2764	2
3	·0800	·9005	·7386	·5871	·4356	·2749	3
4	·0770	·8978	·7361	·5849	·4337	·2732	4
35	·0737	·8949	·7335	·5825	·4316	·2713	35
6	·0702	·8917	·7307	·5799	·4293	·2693	6
7	·0668	·8887	·7279	·5775	·4271	·2674	7
8	·0635	·8857	·7253	·5751	·4251	·2656	8
9	·0601	·8828	·7227	·5729	·4231	·2639	9
40	·0566	·8797	·7200	·5705	·4211	·2622	40
1	·0526	.8762	·7169	·5678	·4187	·2602	1
2	·0476	·8717	·7130	·5644	·4157	·2577	2
3	·0416	·8664	·7082	·5601	·4120	·2545	3
4	·0348	·8603	·7027	·5553	·4077	·2508	4
45	·0270	·8533	·6965	·5497	·4027	·2464	45
6	·0188	·8459	·6898	·5437	·3974	·2418	6
7	·0104	·8384	·6831	·5377	·3921	·2371	7
8	·0018	·8307	·6762	·5315	·3867	·2323	8
9	2·9927	·8226	·6689	·5251	·3810	·2274	9
50	·9830	·8140	·6613	·5183	·3750	·2223	50
1	·9724	·8045	·6529	·5108	·3685	·2166	1
2	·9603	·7937	·6433	·5023	·3610	·2101	2
3	·9468	·7817	·6325	·4927	·3525	·2028	3
4	·9321	·7685	·6207	·4822	·3433	·1947	4

Age of elder Life :— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H[M].

4 PER CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
10	2·1295	1·9229	1·6885	1·4471	1.1990	0·9307	10
1	·1327	·9257	·6910	·4491	·2006	·9318	1
2	·1345	·9274	·6925	·4505	·2017	·9326	2
3	·1350	·9280	·6931	·4510	·2022	·9330	3
4	·1340	·9274	·6928	·4509	·2022	·9331	4
15	·1319	·9256	·6915	·4500	·2016	·9328	15
6	·1286	·9230	·6894	·4484	·2005	·9321	6
7	·1247	·9197	·6867	·4463	·1990	·9310	7
8	·1207	·9162	·6838	·4440	·1972	·9297	8
9	·1175	·9133	·6813	·4419	·1956	·9286	9
20	·1157	.9117	·6799	·4408	·1946	·9279	20
1	·1148	·9109	·6792	·4401	·1941	·9275	1
2	·1147	·9108	·6791	·4401	·1940	·9274	2
3	·1149	·9110	·6794	·4403	·1942	·9275	3
4	·1149	·9111	·6795	·4404	·1943	·9276	4
25	·1144	·9107	·6792	·4402	·1942	·9276	25
6	·1135	·9100	·6786	·4398	·1940	·9274	6
7	·1121	·9089	·6777	·4391	·1935	·9271	7
8	·1108	·9077	·6768	·4384	·1929	·9267	8
9	·1094	·9066	·6759	·4377	·1924	·9263	9
30	·1082	·9055	·6750	·4370	·1919	·9260	30
1	·1071	·9046	·6743	·4364	·1914	·9257	1
2	·1059	·9037	·6736	·4359	·1911	·9254	2
3	·1047	·9027	·6728	·4353	·1906	·9252	3
4	·1032	·9015	·6718	·4346	·1901	·9248	4
35	·1016	·9001	·6707	·4337	·1895	·9244	35
6	·0999	·8986	·6695	·4328	·1888	·9239	6
7	·0982	·8972	·6684	·4319	·1881	·9234	7
8	·0967	·8959	·6673	·4310	·1875	·9230	8
9	·0952	·8948	·6664	·4303	·1869	·9226	9
40	·0938	·8937	·6655	·4297	·1865	·9223	40
1	·0922	·8924	·6646	·4290	·1860	·9220	1
2	·0901	·8907	·6633	·4280	·1853	·9216	2
3	·0874	·8885	.6616	·4267	·1844	·9209	3
4	·0842	·8859	·6595	·4252	·1833	·9202	4
45	·0805	·8828	·6570	·4232	·1819	·9193	45
6	·0765	·8794	·6543	·4211	·1803	·9182	6
7	·0724	·8761	·6516	·4190	·1787	·9171	7
8	·0684	·8727	·6489	·4169	·1772	·9161	8
9	·0642	·8692	·6461	·4148	·1756	·9150	9
50	·0598	·8657	·6433	·4127	·1740	·9139	50
1	·0551	·8618	·6403	·4103	·1724	·9128	1
2	·0495	·8572	·6367	·4076	·1704	·9115	2
3	·0433	·8521	·6326	·4045	·1681	·9099	3
4	·0364	·8464	·6281	·4010	·1656	·9082	4

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
10	0·6642	0·4084	0·1757	10
1	·6649	·4088	·1759	1
2	·6654	·4091	·1760	2
3	·6657	·4093	·1761	3
4	·6658	·4093	·1761	4
15	·6656	·4093	·1761	15
6	·6652	·4091	·1760	6
7	·6646	·4088	·1759	7
8	·6638	·4083	·1758	8
9	·6630	·4079	·1756	9
20	·6626	·4076	·1755	20
1	·6623	·4075	·1754	1
2	·6622	·4074	·1754	2
3	·6623	·4075	·1754	3
4	·6624	·4075	·1754	4
25	·6624	·4075	·1754	25
6	·6623	·4075	·1754	6
7	·6621	·4074	·1754	7
8	·6618	·4072	·1753	8
9	·6616	·4071	·1753	9
30	·6614	·4070	·1753	30
1	·6612	·4069	·1752	1
2	·6610	·4068	·1752	2
3	·6609	·4067	·1752	3
4	·6607	·4066	·1751	4
35	·6604	·4065	·1751	35
6	·6601	·4063	·1750	6
7	·6598	·4062	·1749	7
8	·6595	·4060	·1749	8
9	·6593	·4059	·1748	9
40	·6591	·4058	·1748	40
1	·6589	·4057	·1748	1
2	·6587	·4056	·1747	2
3	·6583	·4054	·1746	3
4	·6579	·4052	·1746	4
45	·6573	·4049	·1745	45
6	·6566	·4045	·1743	6
7	·6559	·4041	·1742	7
8	·6553	·4038	·1741	8
9	·6546	·4034	·1739	9
50	·6539	·4031	·1738	50
1	·6533	·4027	·1737	1
2	·6525	·4023	·1735	2
3	·6515	·4018	·1733	3
4	·6505	·4013	·1731	4

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	10	11	12	13	14	15	
55	20·5286	20·4355	20·3303	20·2156	20·0941	19·9680	55
6	·5011	·4074	·3012	·1853	·0624	·9348	6
7	·4746	·3802	·2731	·1560	·0317	·9027	7
8	·4189	·3540	·2459	·1277	·0021	·8715	8
9	·4242	·3287	·2199	·1004	19·9735	·8415	9
60	·4005	·3045	·1948	·0743	·9461	·8126	60
1	·3779	·2815	·1710	·0494	·9199	·7850	1
2	·3564	·2595	·1483	·0256	·8948	·7586	2
3	·3357	·2385	·1265	·0028	·8708	·7333	3
4	·3163	·2187	·1060	19·9814	·8482	·7094	4
65	·2979	·1999	·0865	·9609	·8266	·6865	65
6	·2804	·1821	·0680	·9415	·8061	·6648	6
7	·2640	·1654	·0507	·9233	·7867	·6442	7
8	·2483	·1495	·0343	·9059	·7683	·6246	8
9	·2336	·1346	·0188	·8897	·7510	·6061	9
70	·2197	·1206	·0043	·8744	·7347	·5886	70
1	·2068	·1076	19·9908	·8601	·7195	·5724	1
2	·1949	·0957	·9785	·8471	·7056	·5574	2
3	·1840	·0847	·9672	·8351	·6927	·5436	3
4	·1741	·0749	·9570	·8244	·6812	·5311	4
75	·1651	·0659	·9477	·8145	·6706	·5197	75
6	·1568	·0577	·9393	·8056	·6610	·5092	6
7	·1493	·0502	·9316	·7975	·6522	·4996	7
8	·1423	·0433	·9245	·7900	·6441	·4908	8
9	·1359	·0370	·9181	·7832	·6368	·4828	9
80	·1299	·0312	·9122	·7769	·6300	·4753	80
1	·1245	·0260	·9069	·7714	·6240	·4688	1
2	·1198	·0215	·9023	·7665	·6187	·4629	2
3	·1156	·0174	·8982	·7622	·6140	·4577	3
4	·1118	·0137	·8945	·7582	·6097	·4530	4
85	·1084	·0105	·8911	·7547	·6058	·4487	85
6	·1051	·0073	·8880	·7513	·6021	·4446	6
7	·1018	·0043	·8849	·7481	·5985	·4405	7
8	·0986	·0013	·8220	·7449	·5951	·4366	8
9	·0952	19·9983	·8791	·7419	·5917	·4329	9
90	·0919	·9953	·8763	·7391	·5886	·4293	90
1	·0887	·9926	·8737	·7366	·5859	·4262	1
2	·0858	·9901	·8715	·7344	·5836	·4236	2
3	·0830	·9878	·8695	·7325	·5816	·4213	3
4	·0806	·9858	·8678	·7309	·5800	·4196	4
95	·0787	·9842	·8664	·7296	·5788	·4182	95
6	·0774	·9831	·8655	·7288	·5780	·4174	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	16	17	18	19	20	21	
55	19·8400	19·7119	19·5863	19·4651	19·3483	19·2325	55
6	·8052	·6757	·5487	·4262	·3083	·1916	6
7	·7716	·6405	·5122	·3885	·2696	·1519	7
8	·7389	·6064	·4767	·3519	·2320	·1134	8
9	·7073	·5734	·4424	·3164	·1956	·0762	9
60	·6770	·5417	·4093	·2823	·1606	·0403	60
1	·6480	·5113	·3777	·2496	·1270	·0060	1
2	·6202	·4821	·3473	·2181	·0947	18·9730	2
3	·5935	·4541	·3181	·1879	·0638	·9413	3
4	·5682	·4276	·2904	·1593	·0344	·9113	4
65	·5441	·4022	·2639	·1318	·0062	·8825	65
6	·5211	·3779	·2385	·1056	18·9793	·8551	6
7	·4993	·3549	·2144	·0806	·9537	·8289	7
8	·4784	·3329	·1914	·0567	·9292	·8039	8
9	·4587	·3120	·1694	·0340	·9058	·7801	9
70	·4401	·2923	·1487	·0125	·8837	·7576	70
1	·4227	·2737	·1292	18·9922	·8629	·7364	1
2	·4066	·2566	·1111	·9734	·8437	·7167	2
3	·3918	·2408	·0944	·9560	·8258	·6986	3
4	·3783	·2264	·0792	·9402	·8096	·6820	4
75	·3660	·2132	·0652	·9256	·7947	·6668	75
6	·3547	·2010	·0523	·9122	·7808	·6527	6
7	·3443	·1898	·0404	·8997	·7680	·6397	7
8	·3346	·1794	·0293	·8881	·7561	·6276	8
9	·3258	·1699	·0191	·8774	·7451	·6164	9
80	·3177	·1610	·0096	·8675	·7349	·6060	80
1	·3105	·1531	·0012	·8586	·7257	·5967	1
2	·3040	·1461	18·9936	·8507	·7176	·5884	2
3	·2983	·1398	·9869	·8435	·7102	·5809	3
4	·2931	·1341	·9807	·8370	·7035	·5741	4
85	·2883	·1289	·9751	·8311	·6974	·5679	85
6	·2837	·1238	·9696	·8254	·6915	·5619	6
7	·2792	·1188	·9642	·8196	·6856	·5559	7
8	·2748	·1139	·9588	·8139	·6797	·5499	8
9	·2704	·1089	·9533	·8081	·6737	·5438	9
90	·2663	·1042	·9480	·8024	·6678	·5378	90
1	·2627	·1000	·9432	·7972	·6623	·5323	1
2	·2596	·0963	·9390	·7925	·6575	·5273	2
3	·2569	·0932	·9351	·7884	·6531	·5228	3
4	·2549	·0907	·9324	·7851	·6495	·5191	4
95	·2533	·0888	·9302	·7825	·6468	·5162	95
6	·2524	·0877	·9287	·7808	·6449	·5143	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	22	23	24	25	26	27	
55	19·1159	18·9962	18·8716	18·7418	18·6077	18·4699	55
6	·0741	·9532	·8275	·6964	·5609	·4214	6
7	·0335	·9116	·7818	·6525	·5155	·3746	7
8	18·9941	·8714	·7434	·6099	·4717	·3293	8
9	·9561	·8324	·7035	·5688	·4293	·2857	9
60	·9194	·7950	·6651	·5293	·3886	·2437	60
1	·8844	·7591	·6284	·4915	·3497	·2035	1
2	·8507	·7247	·5931	·4553	·3124	·1650	2
3	·8184	·6918	·5593	·4206	·2767	·1282	3
4	·7878	·6605	·5273	·3877	·2428	·0933	4
65	·7584	·6305	·4967	·3562	·2105	·0599	65
6	·7304	·6020	·4674	·3263	·1796	·0281	6
7	·7038	·5749	·4397	·2978	·1503	17·9979	7
8	·6783	·5489	·4132	·2705	·1223	·9690	8
9	·6541	·5242	·3880	·2447	·0957	·9416	9
70	·6312	·5009	·3642	·2203	·0705	·9157	70
1	·6097	·4790	·3418	·1973	·0469	·8914	1
2	·5897	·4587	·3211	·1761	·0251	·8689	2
3	·5713	·4400	·3019	·1565	·0049	·8481	3
4	·5545	·4229	·2846	·1386	17·9866	·8292	4
75	·5391	·4073	·2686	·1223	·9698	·8119	75
6	·5248	·3928	·2538	·1071	·9542	·7958	6
7	·5116	·3794	·2402	·0932	·9399	·7811	7
8	·4993	·3670	·2276	·0803	·9266	·7674	8
9	·4880	·3555	·2159	·0683	·9143	·7547	9
80	·4775	·3449	·2051	·0572	·9029	·7430	80
1	·4681	·3354	·1954	·0473	·8927	·7325	1
2	·4597	·3269	·1868	·0385	·8837	·7231	2
3	·4521	·3193	·1791	·0306	·8755	·7147	3
4	·4453	·3123	·1720	·0234	·8681	·7071	4
85	·4390	·3060	·1656	·0168	·8614	·7001	85
6	·4330	·2999	·1594	·0105	·8549	·6934	6
7	·4269	·2938	·1532	·0042	·8484	·6867	7
8	·4209	·2878	·1471	17·9979	·8419	·6801	8
9	·4148	·2817	·1409	·9916	·8354	·6733	9
90	·4088	·2756	·1348	·9854	·8291	·6668	90
1	·4032	·2701	·1293	·9798	·8233	·6608	1
2	·3983	·2652	·1244	·9748	·8181	·6554	2
3	·3938	·2608	·1200	·9703	·8136	·6507	3
4	·3901	·2571	·1163	·9666	·8098	·6468	4
95	·3872	·2542	·1135	·9638	·8069	·6438	95
6	·3852	·2523	·1116	·9619	·8050	·6418	6

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	28	29	30	31	32	33	
55	18·3293	18·1865	18·0413	17·8938	17·7432	17·5894	55
6	·2793	·1347	17·9878	·8383	·6856	·5297	6
7	·2309	·0847	·9359	·7847	·6300	·4720	7
8	·1841	·0363	·8860	·7329	·5764	·4164	8
9	·1390	17·9897	·8377	·6830	·5247	·3629	9
60	·0957	·9449	·7915	·6352	·4752	·3115	60
1	·0541	·9022	·7472	·5895	·4279	·2625	1
2	·0144	·8611	·7050	·5458	·3827	·2156	2
3	17·9765	·8219	·6645	·5040	·3395	·1709	3
4	·9404	·7848	·6261	·4644	·2986	·1286	4
65	·9060	·7493	·5895	·4266	·2596	·0882	65
6	·8732	·7155	·5546	·3907	·2224	·0498	6
7	·8421	·6834	·5216	·3565	·1872	·0134	7
8	·8123	·6527	·4900	·3240	·1536	16·9787	8
9	·7841	·6236	·4600	·2931	·1218	·9458	9
70	·7574	·5961	·4317	·2639	·0917	·9148	70
1	·7323	·5703	·4051	·2366	·0635	·8857	1
2	·7091	·5464	·3805	·2113	·0374	·8588	2
3	·6877	·5244	·3578	·1879	·0134	·8340	3
4	·6683	·5044	·3372	·1667	16·9916	·8115	4
75	·6504	·4860	·3183	·1472	·9715	·7908	75
6	·6339	·4690	·3008	·1292	·9530	·7717	6
7	·6187	·4533	·2846	·1127	·9359	·7541	7
8	·6045	·4387	·2697	·0973	·9201	·7378	8
9	·5915	·4253	·2558	·0830	·9054	·7227	9
80	·5794	·4129	·2430	·0699	·8919	·7088	80
1	·5686	·4017	·2316	·0581	·8798	·6963	1
2	·5589	·3918	·2214	·0476	·8690	·6852	2
3	·5503	·3829	·2122	·0382	·8593	·6753	3
4	·5424	·3748	·2039	·0297	·8505	·6662	4
85	·5352	·3674	·1962	·0218	·8425	·6579	85
6	·5283	·3602	·1889	·0143	·8347	·6500	6
7	·5214	·3531	·1816	·0068	·8270	·6420	7
8	·5145	·3461	·1743	16·9993	·8194	·6341	8
9	·5076	·3389	·1670	·9918	·8116	·6261	9
90	·5008	·3319	·1598	·9844	·8040	·6183	90
1	·4946	·3255	·1532	·9777	·7971	·6112	1
2	·4891	·3198	·1473	·9717	·7909	·6049	2
3	·4842	·3148	·1421	·9663	·7855	·5992	3
4	·4802	·3106	·1378	·9619	·7810	·5946	4
95	·4771	·3074	·1345	·9585	·7775	·5911	95
6	·4750	·3052	·1322	·9562	·7751	·5886	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	34	35	36	37	38	39	
55	17·4326	17·2729	17·1106	16·9462	16·7799	16·6113	55
6	·3705	·2082	·0133	·8760	·7065	·5348	6
7	·3106	·1158	16·9783	·8083	·6359	·4610	7
8	·2527	·0857	·9157	·7130	·5678	·3900	8
9	·1971	·0279	·8555	·6803	·5025	·3217	9
60	·1439	16·9725	·7979	·6203	·4399	·2564	60
1	·0930	·9196	·7429	·5630	·3802	·1941	1
2	·0414	·8691	·6904	·5084	·3233	·1348	2
3	16·9980	·8210	·6404	·4563	·2691	·0782	3
4	·9541	·7754	·5930	·4071	·2178	·0247	4
65	·9123	·7321	·5179	·3602	·1690	15·9739	65
6	·8726	·6909	·5052	·3157	·1228	·9257	6
7	·8349	·6518	·4646	·2736	·0789	·8801	7
8	·7990	·6146	·4260	·2336	·0373	·8368	8
9	·7650	·5794	·3895	·1957	15·9979	·7958	9
70	·7328	·5461	·3550	·1599	·9609	·7572	70
1	·7028	·5150	·3228	·1265	·9261	·7212	1
2	·6750	·4862	·2930	·0956	·8941	·6879	2
3	·6494	·4597	·2656	·0672	·8647	·6573	3
4	·6261	·4357	·2407	·0414	·8380	·6296	4
75	·6048	·4137	·2179	·0178	·8135	·6043	75
6	·5851	·3933	·1968	15·9960	·7910	·5809	6
7	·5669	·3745	·1774	·9760	·7702	·5594	7
8	·5501	·3571	·1594	·9574	·7510	·5395	8
9	·5345	·3411	·1428	·9402	·7332	·5211	9
80	·5202	·3262	·1276	·9244	·7169	·5042	80
1	·5073	·3130	·1138	·9102	·7023	·4891	1
2	·4958	·3011	·1016	·8976	·6892	·4756	2
3	·4856	·2905	·0907	·8863	·6776	·4635	3
4	·4763	·2809	·0807	·8761	·6670	·4526	4
85	·4677	·2721	·0717	·8667	·6574	·4426	85
6	·4595	·2636	·0629	·8577	·6480	·4330	6
7	·4513	·2552	·0542	·8487	·6388	·4235	7
8	·4432	·2468	·0455	·8398	·6296	·4141	8
9	·4349	·2383	·0368	·8308	·6204	·4045	9
90	·4269	·2300	·0282	·8219	·6113	·3952	90
1	·4195	·2224	·0203	·8138	·6030	·3867	1
2	·4130	·2156	·0133	·8066	·5955	·3791	2
3	·4072	·2096	·0071	·8002	·5889	·3723	3
4	·4024	·2047	·0020	·7949	·5835	·3667	4
95	·3988	·2009	15·9981	·7908	·5793	·3624	95
6	·3963	·1983	·9954	·7881	·5764	·3595	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	40	41	42	43	44	45	
55	16·4407	16·2675	16·0917	15·9140	15·7353	15·5558	55
6	·3606	·1837	·0040	·8220	·6388	·4544	6
7	·2835	·1030	15·9194	·7333	·5456	·3566	7
8	·2092	·0253	·8379	·6478	·4559	·2623	8
9	·1379	15·9505	·7596	·5656	·3696	·1717	9
60	·0696	·8791	·6846	·4869	·2869	·0848	60
1	·0045	·8110	·6132	·4119	·2081	·0019	1
2	15·9425	·7461	·5452	·3405	·1330	14·9229	2
3	·8835	·6843	·4804	·2725	·0615	·8477	3
4	·8276	·6259	·4192	·2082	14·9939	·7766	4
65	·7746	·5704	·3611	·1471	·9297	·7090	65
6	·7243	·5178	·3059	·0893	·8689	·6450	6
7	·6767	·4681	·2538	·0345	·8114	·5844	7
8	·6316	·4209	·2043	14·9826	·7568	·5270	8
9	·5888	·3763	·1576	·9335	·7051	·4726	9
70	·5487	·3343	·1137	·8874	·6567	·4216	70
1	·5111	·2952	·0727	·8444	·6114	·3739	1
2	·4765	·2590	·0349	·8047	·5697	·3300	2
3	·4447	·2259	·0001	·7683	·5314	·2897	3
4	·4159	·1958	14·9687	·7352	·4967	·2532	4
75	·3896	·1683	·9400	·7051	·4651	·2199	75
6	·3652	·1430	·9135	·6773	·4359	·1891	6
7	·3429	·1197	·8891	·6518	·4090	·1609	7
8	·3223	·0982	·8667	·6282	·3843	·1348	8
9	·3032	·0784	·8460	·6065	·3615	·1108	9
80	·2857	·0602	·8270	·5866	·3406	·0888	80
1	·2700	·0439	·8100	·5688	·3218	·0690	1
2	·2561	·0294	·7948	·5529	·3051	·0515	2
3	·2436	·0164	·7813	·5387	·2902	·0358	3
4	·2323	·0047	·7690	·5259	·2768	·0216	4
85	·2220	14·9940	·7578	·5142	·2644	·0086	85
6	·2120	·9837	·7471	·5029	·2526	13·9962	6
7	·2022	·9735	·7364	·4917	·2408	·9838	7
8	·1925	·9634	·7259	·4807	·2293	·9716	8
9	·1826	·9532	·7153	·4696	·2176	·9593	9
90	·1731	·9433	·7050	·4588	·2063	·9474	90
1	·1643	·9343	·6957	·4491	·1960	·9366	1
2	·1565	·9263	·6874	·4404	·1869	·9269	2
3	·1496	·9192	·6800	·4328	·1789	·9184	3
4	·1439	·9134	·6740	·4265	·1723	·9115	4
95	·1395	·9089	·6694	·4217	·1673	·9062	95
6	·1365	·9058	·6663	·4185	·1639	·9026	6

[210] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^{M}.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	46	47	48	49	50	51	
55	15·3767	15·1986	15·0214	14·8455	14·6708	14·4975	55
6	·2704	·0871	14·9046	·7230	·5427	·3634	6
7	·1678	14·9794	·7916	·6046	·4184	·2332	7
8	·0687	·8754	·6825	·4900	·2983	·1072	8
9	14·9734	·7753	·5773	·3796	·1824	13·9855	9
60	·8822	·6793	·4764	·2736	·0710	·8685	60
1	·7950	·5877	·3801	·1723	13·9644	·7564	1
2	·7119	·5002	·2881	·0755	·8626	·6493	2
3	·6327	·4170	·2005	13·9833	·7655	·5470	3
4	·5578	·3382	·1175	·8959	·6735	·4500	4
65	·4867	·2633	·0387	·8128	·5859	·3578	65
6	·4193	·1922	13·9639	·7340	·5028	·2701	6
7	·3555	·1250	·8930	·6593	·4241	·1870	7
8	·2949	·0613	·8259	·5885	·3494	·1081	8
9	·2377	·0010	·7623	·5215	·2787	·0334	9
70	·1840	13·9444	·7027	·4586	·2123	12·9632	70
1	·1338	·8915	·6470	·3999	·1503	·8978	1
2	·0876	·8428	·5956	·3457	·0931	·8373	2
3	·0451	·7981	·5485	·2961	·0407	·7819	3
4	·0066	·7576	·5058	·2510	12·9931	·7316	4
75	13·9715	·7206	·4669	·2099	·9497	·6857	75
6	·9391	·6865	·4309	·1720	·9097	·6434	6
7	·9094	·6552	·3979	·1372	·8730	·6046	7
8	·8819	·6262	·3675	·1051	·8391	·5687	8
9	·8567	·5996	·3394	·0756	·8079	·5358	9
80	·8335	·5752	·3138	·0485	·7794	·5056	80
1	·8127	·5534	·2907	·0242	·7537	·4785	1
2	·7942	·5339	·2702	·0026	·7310	·4544	2
3	·7777	·5165	·2519	12·9833	·7106	·4329	3
4	·7628	·5008	·2354	·9660	·6923	·4135	4
85	·7491	·4864	·2203	·9500	·6755	·3958	85
6	·7360	·4726	·2057	·9347	·6594	·3787	6
7	·7229	·4589	·1914	·9196	·6434	·3619	7
8	·7101	·4455	·1772	·9047	·6278	·3453	8
9	·6972	·4318	·1629	·8897	·6119	·3286	9
90	·6846	·4186	·1490	·8751	·5966	·3124	90
1	·6732	·4066	·1364	·8618	·5826	·2978	1
2	·6630	·3959	·1251	·8500	·5703	·2847	2
3	·6540	·3864	·1151	·8395	·5593	·2732	3
4	·6467	·3787	·1070	·8310	·5504	·2638	4
95	·6411	·3728	·1008	·8245	·5435	·2567	95
6	·6373	·3687	·0965	·8200	·5388	·2517	6

[211] Age of elder Life:— { Joint Life Annuity, at Top.
Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	52	53	54	55	56	57	
55	14·3256	14·1560	13·9891	———	8·1081	7·9496	55
6	·1852	·0092	·8358	13·6656	———	·8115	6
7	·0490	13·8665	·6866	·5097	13·3363	———	7
8	13·9169	·7281	·5417	·3581	·1779	13·0015	8
9	·7891	·5941	·4012	·2110	·0240	12·8406	9
60	·6662	·4650	·2658	·0689	12·8751	·6849	60
1	·5483	·3411	·1356	12·9323	·7318	·5347	1
2	·4355	·2224	·0108	·8011	·5941	·3902	2
3	·3279	·1090	12·8914	·6754	·4620	·2515	3
4	·2256	·0012	·7778	·5558	·3360	·1190	4
65	·1282	12·8985	·6695	·4416	·2157	11·9923	65
6	·0357	·8008	·5663	·3328	·1009	·8713	6
7	12·9479	·7081	·4683	·2292	11·9916	·7560	7
8	·8646	·6200	·3752	·1307	·8875	·6460	8
9	·7856	·5364	·2868	·0372	·7886	·5414	9
70	·7114	·4578	·2036	11·9491	·6953	·4427	70
1	·6421	·3844	·1258	·8667	·6080	·3502	1
2	·5781	·3166	·0539	·7905	·5272	·2645	2
3	·5194	·2544	11·9879	·7205	·4529	·1857	3
4	·4661	·1979	·9280	·6568	·3853	·1140	4
75	·4176	·1464	·8733	·5988	·3237	·0485	75
6	·3727	·0989	·8229	·5452	·2667	10·9879	6
7	·3316	·0552	·7765	·4958	·2142	·9321	7
8	·2936	·0149	·7336	·4503	·1658	·8806	8
9	·2586	11·9778	·6942	·4083	·1211	·8330	9
80	·2266	·9438	·6581	·3699	·0803	·7895	80
1	·1979	·9133	·6256	·3354	·0435	·7503	1
2	·1724	·8862	·5968	·3047	·0108	·7155	2
3	·1496	·8619	·5710	·2772	10·9815	·6842	3
4	·1290	·8401	·5478	·2525	·9551	·6561	4
85	·1102	·8201	·5265	·2298	·9309	·6303	85
6	·0921	·8009	·5060	·2080	·9076	·6054	6
7	·0743	·7819	·4859	·1865	·8847	·5809	7
8	·0568	·7633	·4661	·1654	·8622	·5568	8
9	·0391	·7445	·4461	·1441	·8394	·5324	9
90	·0219	·7263	·4267	·1234	·8173	·5089	90
1	·0064	·7098	·4092	·1047	·7974	·4875	1
2	11·9926	·6952	·3936	·0881	·7797	·4686	2
3	·9804	·6823	·3799	·0735	·7641	·4519	3
4	·9705	·6718	·3687	·0616	·7514	·4384	4
95	·9630	·6638	·3602	·0525	·7417	·4280	95
6	·9578	·6583	·3544	·0463	·7351	·4209	6

Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hᴹ.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	58	59	60	61	62	63	
55	7·7841	7·6114	7·4327	7·2486	7·0599	6·8673	55
6	·6528	·4869	·3150	·1376	6·9554	·7692	6
7	·5148	·3559	·1908	·0203	·8449	·6653	7
8	——	·2181	·0601	6·8966	·7282	·5554	8
9	12·6613	——	6·9224	·7661	·6047	·4390	9
60	·4985	12·3164	——	·6296	·4755	·3169	60
1	·3413	·1520	11·9677	——	·3409	·1895	1
2	·1898	11·9935	·8019	11·6158	——	·0572	2
3	·0443	·8409	·6422	·4489	11·2613	——	3
4	11·9052	·6949	·4891	·2886	·0937	10·9049	4
65	·7719	·5548	·3421	·1345	10·9324	·7363	65
6	·6444	·4207	·2011	10·9865	·7773	·5739	6
7	·5227	·2925	·0662	·8447	·6284	·4178	7
8	·4067	·1700	10·9371	·7088	·4856	·2679	8
9	·2961	·0532	·8139	·5789	·3488	·1241	9
70	·1917	10·9428	·6972	·4558	·2190	9·9875	70
1	·0937	·8391	·5876	·3399	·0968	·8586	1
2	·0030	·7430	·4857	·2322	9·9829	·7385	2
3	10·9194	·6544	·3919	·1328	·8778	·6275	3
4	·8433	·5736	·3062	·0421	·7817	·5259	4
75	·7737	·4997	·2278	9·9590	·6937	·4327	75
6	·7093	·4313	·1551	·8818	·6119	·3460	6
7	·6499	·3681	·0880	·8104	·5362	·2657	7
8	·5951	·3097	·0258	·7444	·4660	·1913	8
9	·5445	·2558	9·9684	·6832	·4010	·1222	9
80	·4981	·2063	·9157	·6271	·3413	·0588	80
1	·4563	·1618	·8682	·5765	·2874	·0014	1
2	·4192	·1222	·8259	·5315	·2394	8·9503	2
3	·3858	·0866	·7879	·4909	·1962	·9043	3
4	·3558	·0546	·7538	·4545	·1573	·8629	4
85	·3282	·0251	·7223	·4209	·1215	·8247	85
6	·3017	9·9967	·6919	·3885	·0869	·7879	6
7	·2754	·9686	·6619	·3564	·0526	·7513	7
8	·2496	·9410	·6323	·3247	·0188	·7152	8
9	·2236	·9130	·6023	·2926	8·9844	·6784	9
90	·1983	·8859	·5732	·2613	·9509	·6426	90
1	·1754	·8613	·5468	·2329	·9204	·6099	1
2	·1552	·8395	·5233	·2077	·8933	·5808	2
3	·1373	·8203	·5026	·1854	·8692	·5549	3
4	·1228	·8047	·4858	·1673	·8497	·5339	4
95	·1117	·7928	·4731	·1535	·8348	·5178	95
6	·1041	·7846	·4642	·1439	·8245	·5067	6

[213] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	64	65	66	67	68	69	
55	6·6713	6·4713	6·2665	6·0563	5·8400	5·6158	55
6	·5796	·3857	·1869	5·9824	·7717	·5529	6
7	·4822	·2947	·1021	·9036	·6988	·4857	7
8	·3789	·1980	·0119	·8198	·6210	·4139	8
9	·2694	·0953	5·9158	·7302	·5379	·3370	9
60	·1544	5·9872	·8146	·6357	·4500	·2555	60
1	·0342	·8741	·7085	·5365	·3576	·1698	1
2	5·9092	·7563	·5978	·4329	·2609	·0800	2
3	·7797	·6341	·4829	·3252	·1603	4·9864	3
4	——	·5080	·3641	·2136	·0560	·8892	4
65	10·5468	——	·2406	·0975	4·9472	·7878	65
6	·3771	10·1864	——	4·9759	·8331	·6812	6
7	·2138	·0157	9·8237	——	·7128	·5684	7
8	·0566	9·8512	·6517	9·4582	——	·4487	8
9	9·9057	·6929	·4859	·2849	9·0898	——	9
70	·7620	·5420	·3277	·1191	8·9163	8·7194	70
1	·6263	·3994	·1779	8·9619	·7515	·5468	1
2	·4947	·2661	·0377	·8146	·5968	·3845	2
3	·3826	·1426	8·9076	·6777	·4529	·2334	3
4	·2753	·0294	·7882	·5519	·3205	·0940	4
75	·1768	8·9254	·6784	·4361	·1984	7·9653	75
6	·0850	·8283	·5759	·3277	·0840	·8446	6
7	·0000	·7383	·4807	·2270	7·9774	·7319	7
8	8·9211	·6547	·3921	·1332	·8781	·6268	8
9	·8478	·5771	·3098	·0459	·7856	·5286	9
80	·7804	·5056	·2339	7·9654	·7002	·4379	80
1	·7195	·4409	·1652	·8925	·6226	·3555	1
2	·6652	·3831	·1038	·8272	·5533	·2816	2
3	·6162	·3310	·0484	·7683	·4906	·2149	3
4	·5722	·2841	7·9986	·7152	·4340	·1546	4
85	·5315	·2408	·9523	·6659	·3814	·0984	85
6	·4922	·1989	·9077	·6182	·3305	·0439	6
7	·4532	·1574	·8634	·5709	·2797	6·9896	7
8	·4148	·1164	·8196	·5240	·2295	·9356	8
9	·3755	·0745	·7749	·4762	·1782	·8803	9
90	·3372	·0336	·7312	·4295	·1281	·8262	90
1	·3023	7·9964	·6915	·3870	·0824	·7770	1
2	·2711	·9631	·6559	·3490	·0417	·7329	2
3	·2434	·9335	·6243	·3152	·0054	·6938	3
4	·2209	·9093	·5985	·2876	6·9759	·6619	4
95	·2036	·8908	·5787	·2665	·9533	·6375	95
6	·1916	·8780	·5649	·2517	·9375	·6205	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side.

H^{M}.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	70	71	72	73	74	75	
55	5·3865	5·1546	4·9240	4·6987	4·4827	4·2764	55
6	·3288	·1018	·8758	·6548	·4427	·2400	6
7	·2670	·0452	·8241	·6076	·3996	·2008	7
8	·2009	4·9846	·7685	·5568	·3532	·1585	8
9	·1300	·9194	·7087	·5020	·3031	·1127	9
60	·0548	·8501	·6452	·4437	·2497	·0638	60
1	4·9755	·7771	·5780	·3821	·1931	·0119	1
2	·8924	·7003	·5074	·3172	·1336	3·9573	2
3	·8056	·6202	·4335	·2492	·0711	·9000	3
4	·7155	·5369	·3567	·1785	·0061	·8403	4
65	·6213	·4496	·2761	·1043	3·9378	·7775	65
6	·5220	·3575	·1909	·0257	·8654	·7109	6
7	·4168	·2597	·1002	3·9418	·7879	·6394	7
8	·3048	·1553	·0032	·8518	·7045	·5623	8
9	·1840	·0423	3·8978	·7536	·6133	·4777	9
70	———	3·9222	·7854	·6487	·5154	·3865	70
1	8·3495	———	·6672	·5379	·4118	·2897	1
2	·1795	7·9834	———	·4238	·3048	·1894	2
3	·0209	·8174	7·6247	———	·1970	·0883	3
4	7·8745	·6638	·4640	7·2765	———	2·9891	4
75	·7391	·5216	·3151	·1209	6·9404	———	75
6	·6118	·3877	·1746	6·9739	·7871	6·6130	6
7	·4929	·2624	·0428	·8359	·6429	·4629	7
8	·3817	·1449	6·9191	·7060	·5071	·3213	8
9	·2777	·0349	·8030	·5839	·3791	·1877	9
80	·1814	6·9328	·6951	·4703	·2599	·0630	80
1	·0938	·8399	·5967	·3665	·1509	5·9489	1
2	·0152	·7564	·5082	·2730	·0526	·8459	2
3	6·9441	·6808	·4280	·1882	5·9633	·7523	3
4	·8798	·6124	·3554	·1114	·8823	·6673	4
85	·8199	·5485	·2875	·0395	·8065	·5876	85
6	·7617	·4863	·2213	5·9692	·7323	·5094	6
7	·7034	·4239	·1547	·8984	·6572	·4302	7
8	·6454	·3616	·0880	·8273	·5817	·3504	8
9	·5857	·2974	·0189	·7533	·5030	·2668	9
90	·5273	·2341	5·9507	·6800	·4216	·1835	90
1	·4739	·1762	·8879	·6123	·3521	·1063	1
2	·4261	·1241	·8313	·5511	·2863	·0360	2
3	·3835	·0777	·7806	·4960	·2269	4·9724	3
4	·3489	·0399	·7392	·4506	·1778	·9197	4
95	·3224	·0109	·7074	·4157	·1398	·8789	95
6	·3040	5·9907	·6851	·3912	·1130	·8500	6

 Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	76	77	78	79	80	81	
55	4·0716	3·8703	3·6712	3·4725	3·2770	3·0896	55
6	·0386	·8404	·6442	·4482	·2551	·0700	6
7	·0030	·8081	·6150	·4219	·2315	·0488	7
8	3·9645	·7732	·5834	·3933	·2058	·0257	8
9	·9227	·7352	·5490	·3622	·1778	·0004	9
60	·8781	·6945	·5121	·3288	·1476	2·9732	60
1	·8307	·6514	·4728	·2933	·1155	·9442	1
2	·7807	·6057	·4313	·2556	·0814	·9134	2
3	·7283	·5579	·3877	·2161	·0456	·8811	3
4	·6737	·5080	·3423	·1749	·0084	·8474	4
65	·6162	·4555	·2945	·1314	2·9690	·8118	65
6	·5550	·3995	·2435	·0851	·9271	·7739	6
7	·4894	·3394	·1886	·0352	·8818	·7328	7
8	·4183	·2742	·1289	2·9807	·8322	·6879	8
9	·3400	·2020	·0625	·9200	·7768	·6373	9
70	·2554	·1236	2·9902	·8535	·7159	·5816	70
1	·1652	·0398	·9127	·7820	·6502	·5212	1
2	·0715	2·9526	·8317	·7071	·5811	·4576	2
3	2·9769	·8642	·7495	·6309	·5106	·3925	3
4	·8840	·7775	·6687	·5560	·4413	·3284	4
75	·7938	·6932	·5902	·4831	·3739	·2661	75
6	——	·6061	·5089	·4075	·3037	·2012	6
7	6·2916	——	·4258	·3301	·2319	·1345	7
8	·1442	5·9766	——	·2501	·1574	·0652	8
9	·0049	·8316	5·6670	——	·0786	1·9917	9
80	5·8748	·6959	·5258	5·3639	——	·9152	80
1	·7554	·5714	·3961	·2289	5·0715	——	1
2	·6477	·4589	·2788	·1067	4·9445	4·7946	2
3	·5496	·3564	·1719	4·9953	·8286	·6744	3
4	·4606	·2633	·0747	·8940	·7233	·5651	4
85	·3770	·1758	4·9833	·7986	·6240	·4622	85
6	·2948	·0896	·8930	·7043	·5256	·3600	6
7	·2113	·0018	·8008	·6076	·4246	·2548	7
8	·1270	4·9128	·7070	·5090	·3212	·1468	8
9	·0384	·8191	·6079	·4043	·2108	·0308	9
90	4·9499	·7251	·5082	·2984	·0986	3·9125	90
1	·8677	·6376	·4150	·1992	3·9931	·8006	1
2	·7927	·5576	·3297	·1080	·8956	·6967	2
3	·7246	·4848	·2519	·0246	·8059	·6007	3
4	·6681	·4244	·1872	3·9549	·7309	·5199	4
95	·6242	·3773	·1366	·9005	·6720	·4561	95
6	·5930	·3437	·1006	·8617	·6298	·4103	6

Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	82	83	84	85	86	87	
55	2·9159	2·7540	2·6077	2·4706	2·3330	2·1858	55
6	·8983	·7382	·5936	·4580	·3219	·1761	6
7	·8792	·7211	·5782	·4442	·3097	·1655	7
8	·8584	·7024	·5614	·4292	·2963	·1539	8
9	·8356	·6818	·5428	·4125	·2815	·1409	9
60	·8111	·6597	·5228	·3945	·2655	·1268	60
1	·7848	·6360	·5014	·3752	·2482	·1116	1
2	·7570	·6108	·4787	·3547	·2299	·0955	2
3	·7278	·5844	·4548	·3332	·2106	·0785	3
4	·6973	·5569	·4299	·3108	·1907	·0610	4
65	·6652	·5279	·4038	·2873	·1698	·0426	65
6	·6309	·4969	·3757	·2622	·1474	·0230	6
7	·5937	·4632	·3453	·2348	·1231	·0017	7
8	·5528	·4261	·3117	·2045	·0960	1·9781	8
9	·5068	·3841	·2734	·1698	·0649	·9505	9
70	·4558	·3375	·2308	·1309	·0297	·9193	70
1	·4003	·2865	·1839	·0880	1·9908	·8845	1
2	·3417	·2325	·1341	·0422	·9490	·8469	2
3	·2816	·1770	·0828	1·9949	·9058	·8079	3
4	·2223	·1222	·0322	·9482	·8630	·7694	4
75	·1647	·0689	1·9829	·9028	·8216	·7321	75
6	·1045	·0132	·9312	·8550	·7778	·6926	6
7	·0426	1·9557	·8778	·8055	·7323	·6514	7
8	1·9781	·8956	·8218	·7534	·6843	·6078	8
9	·9095	·8315	·7618	·6974	·6323	·5603	9
80	·8378	·7643	·6986	·6381	·5771	·5094	80
1	·7658	·6966	·6349	·5780	·5208	·4573	1
2		·6322	·5741	·5207	·4670	·4073	2
3	4·5344		·5161	·4660	·4156	·3594	3
4	·4215	4·2901		·4174	·3701	·3172	4
85	·3151	·1804	4·0580		·3288	·2792	85
6	·2094	·0714	3·9159	3·8274		·2415	6
7	·1004	3·9589	·8301	·7083	3·5866		7
8	3·9881	·8427	·7103	·5851	·4597	3·3291	8
9	·8671	·7170	·5804	·4511	·3215	·1859	9
90	·7430	·5876	·4463	·3126	·1783	·0375	90
1	·6252	·4642	·3180	·1799	·0412	2·8951	1
2	·5152	·3485	·1975	·0549	2·9118	·7606	2
3	·4130	·2404	·0842	2·9371	·7896	·6337	3
4	·3264	·1483	2·9873	·8360	·6845	·5243	4
95	·2578	·0749	·9096	·7546	·5997	·4359	95
6	·2082	·0214	·8527	·6949	·5372	·3705	6

 Age of elder Life:— { Joint Life Annuity, at Top. / Last Survivor Annuity, at Side. }

H^M.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	88	89	90	91	92	93	
55	2·0288	1·8401	1·6231	1·3972	1·1628	0·9063	55
6	·0205	·8333	·6177	·3930	·1597	·9042	6
7	·0115	·8259	·6117	·3885	·1564	·9020	7
8	·0016	·8176	·6052	·3835	·1527	·8995	8
9	1·9904	·8084	·5978	·3778	·1486	·8967	9
60	·9783	·7983	·5897	·3715	·1440	·8936	60
1	·9652	·7873	·5809	·3647	·1389	·8901	1
2	·9512	·7756	·5714	·3573	·1334	·8864	2
3	·9365	·7633	·5614	·3495	·1276	·8824	3
4	·9213	·7506	·5512	·3415	·1217	·8783	4
65	·9055	·7374	·5406	·3332	·1155	·8740	65
6	·8887	·7234	·5294	·3245	·1091	·8696	6
7	·8705	·7083	·5173	·3152	·1022	·8649	7
8	·8502	·6915	·5039	·3050	·0947	·8599	8
9	·8264	·6717	·4881	·2927	·0858	·8538	9
70	·7992	·6489	·4696	·2784	·0752	·8467	70
1	·7687	·6229	·4485	·2618	·0629	·8382	1
2	·7355	·5946	·4251	·2433	·0489	·8285	2
3	·7009	·5649	·4005	·2236	·0338	·8178	3
4	·6668	·5355	·3762	·2041	·0189	·8072	4
75	·6338	·5074	·3530	·1856	·0049	·7974	75
6	·5988	·4774	·3282	·1658	0·9898	·7868	6
7	·5623	·4460	·3023	·1452	·9742	·7759	7
8	·5235	·4126	·2746	·1232	·9575	·7642	8
9	·4808	·3755	·2437	·0983	·9385	·7508	9
80	·4347	·3351	·2096	·0705	·9170	·7356	80
1	·3872	·2932	·1738	·0411	·8940	·7189	1
2	·3415	·2525	·1389	·0121	·8711	·7022	2
3	·2975	·2132	·1049	0·9837	·8484	·6854	3
4	·2589	·1788	·0752	·9589	·8284	·6706	4
85	·2243	·1483	·0491	·9372	·8112	·6579	85
6	·1903	·1185	·0240	·9165	·7949	·6460	6
7	·1522	·0854	0·9961	·8939	·7774	·6332	7
8		·0491	·9661	·8702	·7596	·6212	8
9	3·0441		·9205	·8331	·7311	·6010	9
90	2·8894	2·7250		·7790	·6881	·5695	90
1	·7407	·5678	2·3842		·6360	·5310	1
2	·6003	·4188	·2241	2·0316		·4837	2
3	·4676	·2778	·0716	1·8655	1·6618		3
4	·3536	·1563	1·9396	·7207	·5012	1·2781	4
95	·2617	·0584	·8325	·6026	·3691	·1262	95
6	·1938	1·9863	·7532	·5145	·2703	·0106	6

[218] Age of elder Life:— { Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

Hm.

4 PER-CENT.

Values of Annuities on Two Joint Lives, and on the Last Survivor of Two Lives.

	94	95	96	
55	0·6493	0·4007	0·1729	55
6	·6480	·4000	·1726	6
7	·6466	·3993	·1724	7
8	·6451	·3985	·1721	8
9	·6434	·3976	·1718	9
60	·6415	·3965	·1714	60
1	·6393	·3954	·1710	1
2	·6370	·3942	·1705	2
3	·6345	·3929	·1700	3
4	·6319	·3915	·1695	4
65	·6293	·3901	·1689	65
6	·6265	·3886	·1684	6
7	·6236	·3870	·1678	7
8	·6205	·3854	·1672	8
9	·6168	·3835	·1665	9
70	·6124	·3812	·1656	70
1	·6071	·3784	·1646	1
2	·6010	·3751	·1634	2
3	·5943	·3715	·1620	3
4	·5874	·3677	·1605	4
75	·5812	·3643	·1592	75
6	·5744	·3606	·1578	6
7	·5674	·3568	·1564	7
8	·5600	·3529	·1549	8
9	·5516	·3483	·1531	9
80	·5417	·3429	·1511	80
1	·5308	·3369	·1487	1
2	·5199	·3308	·1464	2
3	·5086	·3243	·1438	3
4	·4986	·3186	·1415	4
85	·4901	·3138	·1395	85
6	·4822	·3093	·1378	6
7	·4737	·3044	·1358	7
8	·4663	·3005	·1344	8
9	·4536	·2938	·1319	9
90	·4326	·2820	·1273	90
1	·4069	·2673	·1214	1
2	·3754	·2498	·1146	2
3	·3274	·2216	·1032	3
4	———	·1830	·0870	4
95	0·8959	———	·0641	95
6	·7579	0·5231	———	6

[219] Age of elder Life:— Joint Life Annuity, at Top. Last Survivor Annuity, at Side.

H^M.

AUXILIARY TABLES.

H^M.

Auxiliary Series, for the formation of Survivorship Assurance Tables.

x	Log $(p_x^{-1}-1)$	Δ	$-\Delta$	Log $\frac{1}{2}(p_x^{-1}+1)$	Δ	$-\Delta$	x
10	$\bar{3}$·692 329	910 331	089 669	0·001 068	999 801	000 199	10
1	·602 660	919 849	080 151	·000 869	999 853	000 147	1
2	·522 509	943 464	056 536	·000 722	999 912	000 088	2
3	·465 973	976 378	023 622	·000 634	999 967	000 033	3
4	·442 351	016 929	983 071	·000 601	000 024	999 976	4
15	·459 280	053 590	946 410	·000 625	000 081	999 919	15
6	·512 870	077 902	922 098	·000 706	000 140	999 860	6
7	·590 772	091 833	908 167	·000 846	000 199	999 801	7
8	·682 605	079 191	920 809	·001 045	000 208	999 792	8
9	·761 796	042 300	957 700	·001 253	000 128	999 872	9
20	·804 096	026 524	973 476	·001 381	000 087	999 913	20
1	·830 620	007 685	992 315	·001 468	000 027	999 973	1
2	·838 305	994 855	005 145	·001 495	999 981	000 019	2
3	·833 160	991 862	008 138	·001 476	999 973	000 027	3
4	·825 022	999 384	000 616	·001 449	999 998	000 002	4
25	·824 406	003 616	996 384	·001 447	000 012	999 988	25
6	·828 022	014 110	985 890	·001 459	000 048	999 952	6
7	·842 132	016 615	983 385	·001 507	000 059	999 941	7
8	·858 747	015 677	984 323	·001 566	000 057	999 943	8
9	·874 424	016 711	983 289	·001 623	000 063	999 937	9
30	·891 135	010 899	989 101	·001 686	000 044	999 956	30
1	·902 034	010 248	989 752	·001 730	000 041	999 959	1
2	·912 282	009 628	990 372	·001 771	000 040	999 960	2
3	·921 910	011 407	988 593	·001 811	000 048	999 952	3
4	·933 317	013 691	986 309	·001 859	000 059	999 941	4
35	·947 008	016 415	983 585	·001 918	000 074	999 926	35
6	·963 423	016 767	983 233	·001 992	000 078	999 922	6
7	·980 190	014 437	985 563	·002 070	000 069	999 931	7
8	·994 627	013 302	986 698	·002 139	000 068	999 932	8
9	$\bar{2}$·007 929	009 651	990 349	·002 207	000 049	999 951	9
40	·017 580	007 640	992 360	·002 256	000 040	999 960	40
1	·025 220	010 245	989 755	·002 296	000 054	999 946	1
2	·035 465	015 767	984 233	·002 350	000 086	999 914	2
3	·051 232	016 643	983 357	·002 436	000 096	999 904	3
4	·067 875	023 533	976 467	·002 532	000 139	999 861	4
45	·091 408	026 192	973 808	·002 671	000 167	999 833	45
6	·117 600	025 184	974 816	·002 838	000 169	999 831	6
7	·142 784	023 093	976 907	·003 007	000 164	999 836	7
8	·165 877	023 199	976 801	·003 171	000 172	999 828	8
9	·189 076	020 675	979 325	·003 343	000 162	999 838	9
50	·209 751	019 483	980 517	·003 505	000 161	999 839	50
1	·229 234	022 716	977 284	·003 666	000 195	999 805	1
2	·251 950	025 728	974 272	·003 861	000 235	999 765	2
3	·277 678	026 196	973 804	·004 096	000 253	999 747	3
4	·303 874	028 270	971 730	·004 349	000 292	999 708	4

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Auxiliary Series, for the formation of Survivorship Assurance Tables—(continued).

x	Log $(p_x^{-1}-1)$	Δ	−Δ	Log $\frac{1}{2}(p_x^{-1}+1)$	Δ	−Δ	x
55	$\bar{2}$·332 144	028 991	971 009	0·004 641	000 318	999 682	55
6	·361 135	029 438	970 562	·004 959	000 347	999 653	6
7	·390 573	029 378	970 622	·005 306	000 368	999 632	7
8	·419 951	032 120	967 880	·005 674	000 431	999 569	8
9	·452 071	033 441	966 559	·006 105	000 486	999 514	9
60	·485 512	034 300	965 700	·006 591	000 537	999 463	60
1	·519 812	035 027	964 973	·007 128	000 594	999 406	1
2	·554 839	035 673	964 327	·007 722	000 655	999 345	2
3	·590 512	033 895	966 105	·008 377	000 673	999 327	3
4	·624 407	032 673	967 327	·009 050	000 699	999 301	4
65	·657 080	031 726	968 274	·009 749	000 730	999 270	65
6	·688 806	031 422	968 578	·010 479	000 776	999 224	6
7	·720 228	029 719	970 281	·011 255	000 786	999 214	7
8	·749 947	034 156	965 844	·012 041	000 971	999 029	8
9	·784 103	037 517	962 483	·013 012	001 155	998 845	9
70	·821 620	041 817	958 183	·014 167	001 406	998 594	70
1	·863 437	045 107	954 893	·015 573	001 671	998 329	1
2	·908 544	047 367	952 633	·017 244	001 945	998 055	2
3	·955 911	045 591	954 409	·019 189	002 072	997 928	3
4	$\bar{1}$·001 502	036 289	963 711	·021 261	001 804	998 196	4
75	·037 791	037 880	962 120	·023 065	002 043	997 957	75
6	·075 671	036 742	963 258	·025 108	002 148	997 852	6
7	·112 413	035 349	964 651	·027 256	002 235	997 765	7
8	·147 762	038 295	961 705	·029 491	002 620	997 380	8
9	·186 057	042 124	957 876	·032 111	003 142	996 858	9
80	·228 181	045 281	954 719	·035 253	003 704	996 296	80
1	·273 462	042 056	957 944	·038 957	003 773	996 227	1
2	·315 518	042 950	957 050	·042 730	004 210	995 790	2
3	·358 468	036 417	963 583	·046 940	003 874	996 126	3
4	·394 885	029 408	970 592	·050 814	003 347	996 653	4
85	·424 293	025 161	974 839	·054 161	003 027	996 973	85
6	·449 454	028 792	971 208	·057 188	003 657	996 343	6
7	·478 246	019 482	980 518	·060 845	002 597	997 403	7
8	·497 728	032 524	967 476	·063 442	004 566	995 434	8
9	·530 252	058 392	941 608	·068 008	008 966	991 034	9
90	·588 644	069 414	930 586	·076 974	012 056	987 944	90
1	·658 058	075 603	924 397	·089 030	015 043	984 957	1
2	·733 661	118 623	881 377	·104 073	028 135	971 865	2
3	·852 284	160 397	839 603	·132 208	048 151	951 849	3
4	0·012 681	231 621	768 379	·180 359	093 233	906 767	4
95	·244 302	403 515	596 485	·273 592	234 563	765 437	95
6	·647 817			·508 155			6

Constants.

	Numbers.		Logarithms.	
	v	$1-v$	v	$1-v$
3 per-cent.	·970874	·029126	$\bar{1}$·987163	$\bar{2}$·464284
$3\frac{1}{2}$,,	·966184	·033816	·985060	·529128
4 ,,	·961538	·038462	·982967	·585027
$4\frac{1}{2}$,,	·959938	·043062	·980884	·634096
5 ,,	·952381	·047619	·978811	·677781
6 ,,	·943396	·056604	·974694	·752845

END OF TABLES.

NOTATION.

NOTATION.

i = interest on £1 (or any other monetary unit, say on 1,) for one year.

$v = \dfrac{1}{1+i}$ = the value of 1 due a year hence.

$\delta = \log_e(1+i) =$ Nap Log $(1+i) =$ the *force of discount;*

= the nominal yearly rate of interest when (interest being convertible momently) the effective rate of interest is i.

$i^{(m)}$ = the effective rate of interest when the nominal rate of interest i is convertible m times a year.

$i^{(2)}$ = Do. do. half-yearly.

$i^{(4)}$ = Do. do. quarterly.

$\bar{i}$ = Do. do. momently.

---

l_x = the number of persons living at the age x according to any mortality table.

N.B. Although the subscript form of notation is used here and throughout this scheme, it will be seen that the notation can equally well be adopted in its essential features by those who may prefer the functional form, $l(x)$, &c.

${}^{1}l_x = l_{x+1} =$ the number of persons living at the age $x+1$.

${}^{n}l_x = l_{x+n} =$,, ,, $x+n$.

${}^{-1}l_x = l_{x-1} =$,, ,, $x-1$.

${}^{-n}l_x = l_{x-n} =$,, ,, $x-n$.

$d_x = l_x - l_{x+1} =$ the number of persons dying between the ages x and $x+1$.

${}^{1}d_x = d_{x+1} = l_{x+1} - l_{x+2}$

${}^{n}d_x = d_{x+n} = l_{x+n} - l_{x+n+1}$

${}^{-1}d_x = d_{x-1} = l_{x-1} - l_x$

${}^{-n}d_x = d_{x-n} = l_{x-n} - l_{x-n+1}$

$l_{xy} = l_x . l_y$ $\qquad$ $l_{xyz} = l_x . l_y . l_z$

${}^{1}l_{xy} = l_{x+1} . l_{y+1}$ $\qquad$ ${}^{1}l_{xyz} = l_{x+1} . l_{y+1} . l_{z+1}$

${}^{-1}l_{xy} = l_{x-1} . l_{y-1}$ $\qquad$ ${}^{-1}l_{xyz} = l_{x-1} . l_{y-1} . l_{z-1}$

$d_{xy} = l_{xy} - {}^{1}l_{xy} = l_x . l_y - l_{x+1} . l_{y+1}$

$$
\begin{aligned}
{}^{n}d_{xy} &= d_{x+n\cdot y+n} = {}^{n}l_{xy} - {}^{n+1}l_{xy} = l_{x+n}\cdot l_{y+n} - l_{x+n+1}\cdot l_{y+n+1} \\
{}^{-n}d_{xy} &= d_{x-n\cdot y-n} = {}^{-n}l_{xy} - {}^{-n+1}l_{xy} = l_{x-n}\cdot l_{y-n} - l_{x-n+1}\cdot l_{y-n+1} \\
{}^{n-m}l_x &= l_{x+n-m} \qquad\qquad {}^{n-m}d_x = d_{x+n-m}.
\end{aligned}
$$

N.B. When there is no risk of misunderstanding, the subscript x, xy, &c. may be omitted. Thus in lieu of

$$a_x = v\frac{{}^{1}l_x}{l_x} + v^2\frac{{}^{2}l_x}{l_x} + v^3\frac{{}^{3}l_x}{l_x} + \ldots\ldots$$

we may write

$$a = v\frac{{}^{1}l}{l} + v^2\frac{{}^{2}l}{l} + v^3\frac{{}^{3}l}{l} + \ldots\ldots\ldots$$

$\mu_x = -\dfrac{1}{l_x}\cdot\dfrac{d}{dx}l_x = -\dfrac{d}{dx}\log_\epsilon l_x =$ the *force of mortality* at the age x.

We have approximately

$$\mu_x = \frac{l_{x-1} - l_{x+1}}{2l_x} = \frac{d_{x-1} + d_x}{2l_x}.$$

ω (omega) = the *limiting age*, which none of the lives actually attain.

${}_{n}p_x$ = the probability of a person whose age is x living n years.

p_x = the probability of a person whose age is x living *one* year.

$\left.\begin{matrix} {}_{n}p_{xy} \\ p_{xy} \end{matrix}\right\}$ = the probability of the joint existence of two persons whose ages are x and y continuing $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$\left.\begin{matrix} {}_{n}p_{xyz} \\ p_{xyz} \end{matrix}\right\}$ = the probability of the joint existence of three lives x, y, z, continuing $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$\left.\begin{matrix} {}_{n}p_{\overline{xy}} \\ p_{\overline{xy}} \end{matrix}\right\}$ = the probability of the existence of the last survivor of x and y continuing $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

${}_{n}p_{\overline{xyz}}$ = the probability of one at least of x, y, and z, being alive at the end of n years.

${}_{n}p_{\overline{xyz}}{}^{2}$ = the probability of two at least of x, y, and z, being alive at the end of n years.

$\left.\begin{matrix} {}_{n}q_x \\ q_x \end{matrix}\right\}$ = the probability of x dying within $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$\left.\begin{matrix} {}_{n}q_{xy} \\ q_{xy} \end{matrix}\right\}$ = the probability of the joint existence of x and y failing within $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$\left.\begin{matrix} |_{n}q_{\overline{xy}} \\ q_{\overline{xy}} \end{matrix}\right\}$ = the probability of the last survivor of x and y dying within $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$\left.\begin{matrix} |_{n}q^{1}_{xy} \\ q^{1}_{xy} \end{matrix}\right\}$ = the probability of x dying before y within $\left\{\begin{matrix} n \text{ years,} \\ 1 \text{ year.} \end{matrix}\right.$

$_{m|n}q_x$ = the probability of x dying after the lapse of m years but before the end of the following n years.

N.B. In this expression m and n may be either integral or fractional.

$_{n-1|}q_x$ $\begin{cases} = \text{the probability of } x \text{ dying within a year, deferred } n-1 \text{ years;} \\ = \text{the probability of } x \text{ dying in the } n\text{th year from the present time.} \end{cases}$

$_{n-1|}q_{xy}$ = the probability of the joint existence of x and y failing in the nth year.

$_{n-1|}q_{\overline{xy}}$ = the probability of the existence of the last survivor of x and y failing in the nth year.

$_{n-1|}q^1_{xy}$ = the probability of x dying in the nth year and leaving y surviving.

Q^1_{xy} = the probability of x dying before y.

e_x = the curtate "expectation," or average duration, of life, of a person of the age x.

e_{xy} = the curtate expectation of the joint existence of two persons of the ages x and y.

$e_{\overline{xy}}$ = the curtate expectation of the existence of the last survivor of x and y.

$_{|n}e_x$ = the curtate expectation of life during the next n years of a person of the age x.

$_{n|}e_x$ = the curtate expectation of life after the next n years of the life x.

$\left.\begin{matrix} _{|n}e_{xy}, & _{n|}e_{xy} \\ _{|n}e_{\overline{xy}}, & _{n|}e_{\overline{xy}} \end{matrix}\right\}$ have corresponding meanings for the joint existence of x and y, and the existence of the last survivor, respectively.

The complete expectation is denoted by $\mathring{e}$: thus

$$\mathring{e}_x, \quad \mathring{e}_{xy}, \quad \mathring{e}_{\overline{xy}}, \quad _{|n}\mathring{e}_x, \quad _{n|}\mathring{e}_x, \quad \&c.$$

Endowments.

$_nE_x$ = the value of an endowment of 1 payable in n years if x be then alive.

$\left.\begin{matrix} _nE_{xy} \\ _nE_{xyz} \end{matrix}\right\}$ = Do. if $\left\{\begin{matrix} x \text{ and } y \\ x, y, \text{ and } z \end{matrix}\right\}$ are alive.

$\left.\begin{matrix} _nE_{\overline{xy}} \\ _nE_{\overline{xyz}} \end{matrix}\right\}$ = Do. if one at least of $\left\{\begin{matrix} x \text{ and } y \\ x, y, \text{ and } z \end{matrix}\right\}$ is alive.

$_nE_{\overline{xyz}}^{\,2}$ = Do. if two at least of x, y, and z are alive.

Annuities.

a_x = the present value of an annuity (or annual payment) of 1 due at the end of every year through which x shall live.

N.B. It is always understood (unless otherwise stated) that the annual payment of the annuity is 1.

Obs. An annuity is to be conceived as accruing (or growing) during each instant of the life, lives, or status, on which it depends; but as becoming payable only yearly, half-yearly, or at other stated intervals during the year. In the ordinary case no payment is made on account of the annuity for the year, half-year, quarter, or other interval, in which the life drops or the status fails. When a proportionate part of the annuity is payable for the portion of a year, half-year, or other interval, which has elapsed from the date of the last payment to the day of death, or failure of the status; or, in other words, when the annuity is payable up to the day of death; the annuity is called *complete*.

$^1a_x = a_{x+1}$

$^{-1}a_x = a_{x-1}$

$^{n-m}a_x = a_{x+n-m}$

a_{xy} = the value of an annuity payable during the joint existence of x and y.

a_{xyz} = ditto ditto of x, y, and z.

$a_{xyzw\ldots}$ = ditto ditto of x, y, z, w, &c.

$^1a_{xy} = a_{x+1\cdot y+1}$

$^{-1}a_{xy} = a_{x-1\cdot y-1}$

$^{n-m}a_{xy} = a_{x+n-m\cdot y+n-m}$

$^1a_{xyz} = a_{x+1\cdot y+1\cdot z+1}$

&c. = &c.

$a_{\overline{xy}}$ = the value of an annuity for the existence of the last survivor of x and y.

$a_{\overline{xyz}}$ = ditto x, y, and z.

$a_{\overline{xyzw\ldots}}$ = ditto x, y, z, w, &c.

$a_{\overline{xyz}}{}^{2}$ = the value of an annuity payable so long as any two of x, y, and z are jointly in existence.

$a_{\overline{xyzw\ldots}}{}^{m}$ = the value of an annuity payable so long as the last m survivors of the lives x, y, z, w . . . are alive.

$a_{\overline{x(yz)}}$ = the value of an annuity to continue until x shall have died and the joint existence of y and z have failed.

$a_{\overline{(xy\ldots)(uv\ldots)}}$ = the value of an annuity to continue until the joint existence of x, y, ... shall have failed, and the joint existence of u, v, ... have also failed.

$a_{x.\overline{yz}}$ = the value of an annuity to continue so long as x and either y or z shall be jointly in existence.

$a_{\overline{xy}.\overline{zw}}$ = the value of an annuity to continue so long as one of the lives x, y, and one of the lives z, w, shall be jointly in existence.

$a_{xy.\overline{zw}}$ = the value of an annuity to continue so long as x and y and either z or w shall be in existence.

$^{1}a_{\overline{xy}} = a_{\overline{x+1.y+1}}$

The meanings of $^{-1}a_{\overline{xy}}$, $^{n-m}a_{\overline{xy}}$, &c., are obvious without explanation.

N.B. If the annuity is payable in advance, it is called an *annuity-due* and is denoted by the symbol **a** instead of a. Thus,

$$\mathbf{a}_x = 1 + a_x,$$

$$\mathbf{a}_{xy} = 1 + a_{xy}.$$

It is obvious that any one of the annuities above considered may be payable in advance, and in every such case **a** is to be put instead of a.

N.B. An annuity which is entered upon at the expiration of n years (or runs from the end of n years) is called an annuity *deferred* n years.

$_{n|}a_x$ = an annuity deferred n years and then to continue so long as x shall live.

$\left.\begin{matrix} _{n|}a_{xy} \\ _{n|}a_{xyz} \end{matrix}\right\}$ = ditto during the joint existence of $\begin{cases} x,\ y, \\ x,\ y,\ z. \end{cases}$

$\left.\begin{matrix} _{n|}a_{\overline{xy}} \\ _{n|}a_{\overline{xyz}} \end{matrix}\right\}$ = ditto during the existence of the last survivor of $\begin{cases} x,\ y, \\ x,\ y,\ z. \end{cases}$

$_{n|}a_{\overline{xyz}}^{2}$ = ditto during the joint existence of the two last survivors of x, y, z.

$_{|n}a_x$ = the value of a temporary annuity for the next n years if x shall live so long.

$\left.\begin{matrix} _{|n}a_{xy} \\ _{|n}a_{xyz} \\ _{|n}a_{\overline{xy}} \\ _{|n}a_{\overline{xyz}} \\ \vdots \end{matrix}\right\}$ = the values of temporary annuities for the next n years to depend on the statuses denoted by the suffixes.

$_{n|t}a_x$ = the value of a deferred temporary (or an intercepted) annuity, to be deferred n years and then continue t years, subject to the existence of the life x.

$\left.\begin{array}{r} _{n|t}a_{xy} \\ _{n|t}a_{xyz} \end{array}\right\}$ = ditto, subject to the joint existence of the lives $\left\{\begin{array}{l} x, y, \\ x, y, z. \end{array}\right.$

$\left.\begin{array}{l} _{n|t}a_{\overline{xy}} \\ _{n|t}a_{x\overline{yz}} \\ _{n|t}a_{x\overline{yz}}^{2} \\ _{n|t}a_{xy\overline{zw\ldots\ldots}}^{m} \end{array}\right\}$ = the values of intercepted annuities depending on the statuses denoted by the suffixes.

N.B. If the above annuities are payable in advance, it is understood that a temporary or intercepted annuity-due for t years is one in respect of which t years' payments are to be made, thus,

$$_{t}\mathrm{a}_x = 1 + {}_{t-1}a_x,$$
$$_{|t}\mathrm{a}_{xy} = 1 + {}_{|t-1}a_{xy}.$$

In fact, whatever the status on which the annuity depends, denoting it by X, we have

$$_{t}\mathrm{a}_{\mathrm{X}} = 1 + {}_{t-1}a_{\mathrm{X}};$$

or simply,
$$_{|t}\mathrm{a} = 1 + {}_{t-1}a.$$

We also have

$$\left.\begin{array}{rcl} _{n|}\mathrm{a}_x & = & _{n-1}a_x \\ _{n|}\mathrm{a}_{xy} & = & _{n-1}a_{xy} \\ \vdots & & \vdots \end{array}\right\} \text{ or simply } \quad _{n|}\mathrm{a} = {}_{n-1}a.$$

$$\left.\begin{array}{rcl} _{n|t}\mathrm{a}_x & = & _{n-1|t}a_x \\ _{n|t}\mathrm{a}_{xy} & = & _{n-1|t}a_{xy} \\ \vdots & & \vdots \end{array}\right\} \text{ or simply } \quad _{n|t}\mathrm{a} = {}_{n-1|t}a.$$

N.B. If any of the above annuities is payable by half-yearly instalments, this is denoted by appending $^{(2)}$; thus

$$\begin{array}{llllllll} a_x^{(2)}, & \mathrm{a}_x^{(2)}, & _{n|}a_x^{(2)}, & _{n}\mathrm{a}_x^{(2)}, & _{|n}a_x^{(2)}, & _{n}\mathrm{a}_x^{(2)}, & _{n|t}a_x^{(2)}, & _{n|t}\mathrm{a}_x^{(2)} \\ a_{xy}^{(2)}, & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ a_{xyz}^{(2)}, & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{array}$$

N.B. If the annuity is payable by quarterly instalments, we put $^{(4)}$ instead of $^{(2)}$; and if by instalments m times a year (or by m-ly instalments), $^{(m)}$.

Obs. It will be noticed that

$$\mathrm{a}_x^{(2)} = \tfrac{1}{2} + a_x^{(2)}, \quad \mathrm{a}_x^{(4)} = \tfrac{1}{4} + a_x^{(4)}, \quad \mathrm{a}_x^{(m)} = \tfrac{1}{m} + a_x^{(m)}.$$

Also that we have

$$ {}_{n|}\mathbf{a}_x^{(2)} = {}_{n-\frac{1}{2}|}a_x^{(2)}, \qquad {}_{n|}\mathbf{a}_x^{(m)} = {}_{n-\frac{1}{m}|}a_x^{(m)}. $$

As particular cases, we have

$$ {}_{\frac{1}{2}|}\mathbf{a}_x^{(2)} = a_x^{(2)}, \quad {}_{\frac{1}{m}|}\mathbf{a}_x^{(m)} = a_x^{(m)}. $$

Obs. The period for which an annuity is deferred need not be an exact number of years; but if the first payment is made after a time τ, which may be either integral or fractional, we shall have

${}_{\tau|}\mathbf{a}_x$ = the value of an annuity on x, of which a payment is made first at the time τ, and thenceforward at intervals of a year.

${}_{\tau|}\mathbf{a}_x^{(2)}$ = the value of an annuity on x, payable half-yearly, of which a payment ($=\frac{1}{2}$) is made first at the time τ, and thenceforward at intervals of half a year.

$\left.\begin{matrix} {}_{\tau|}\mathbf{a}_x^{(4)} \\ {}_{\tau|}\mathbf{a}_x^{(m)} \end{matrix}\right\}$ = the values of similar annuities payable respectively by quarterly and m-ly instalments, the first at the time τ.

N.B. We still have

$$ \begin{aligned} {}_{\tau|}\mathbf{a}_x &= {}_{\tau-1|}a_x, \\ {}_{\tau|}\mathbf{a}_x^{(2)} &= {}_{\tau-\frac{1}{2}|}a_x^{(2)}, \\ {}_{\tau|}\mathbf{a}_x^{(m)} &= {}_{\tau-\frac{1}{m}|}a_x^{(m)}. \end{aligned} $$

These annuities may be temporary

$$ {}_{\tau|n}\mathbf{a}_x, \quad {}_{\tau|n}\mathbf{a}_x^{(2)}, \quad {}_{\tau|n}\mathbf{a}_x^{(4)}, \quad {}_{\tau|n}\mathbf{a}_x^{(m)}. $$

Obs. Any of the preceding annuities may be *complete, i.e.* continued up to the day of the death of the life or lives, or of the failure of the status, on which it depends. This is denoted by placing a small circle above the a or a. Thus:—

$\mathring{a}_x$,	${}_{n\|}\mathring{a}_x$,	${}_{\|n}\mathring{a}_x$,	${}_{n\|t}\mathring{a}_x$,	$\mathring{a}_{xy}$,	&c.
$\mathring{\mathbf{a}}_x$,	${}_{n\|}\mathring{\mathbf{a}}_x$,	$\vdots$	$\vdots$	$\vdots$	$\vdots$
$\mathring{a}_x^{(2)}$,	${}_{n\|}\mathring{a}_x^{(2)}$,	$\vdots$	$\vdots$	$\vdots$	$\vdots$
$\mathring{\mathbf{a}}_x^{(2)}$,	${}_{n\|}\mathring{\mathbf{a}}_x^{(2)}$,	$\vdots$	$\vdots$	$\vdots$	$\vdots$
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$

Obs. If the annuity is supposed to be payable momently, it is called a *continuous annuity*, and is denoted by $\bar{a}$. Thus,

$\bar{a}_x$, $\bar{a}_{xy}$, &c.

${}_{n|}\bar{a}_x$, ${}_{n|}\bar{a}_{xy}$, :

${}_{|n}\bar{a}_x$, ${}_{|n}\bar{a}_{xy}$, :

${}_{n|t}\bar{a}_x$, ${}_{n|t}\bar{a}_{xy}$, :

N.B. In this case it makes no difference whether the annuity is payable in advance or not.

Obs. Since a term of n years may be considered as a special kind of life, such that the probability of living over each of the n years is certainty, and the probability of dying at the end of the n years is also certainty, denoting such a term by $\overline{n|}$, we have

$a_{\overline{n|}x}$ = the value of an annuity during the joint existence of a life x and a term of n years certain, *i.e.*,
= a temporary annuity for n years on the life x,
= ${}_{|n}a_x$.

$a_{\overline{\overline{n|}x}}$ = the value of an annuity during the existence of the life x, and the term of n years certain, whichever may endure the longer, *i.e.*,
= the value of an annuity for n years certain, and so much longer as x may live.

Similarly

$a_{\overline{\overline{n|}xy}}$ = the value of an annuity for n years certain, and so much longer as either x or y may live.

$a_{\overline{\overline{n|}(xy)}}$ = the value of an annuity for n years certain, and so much longer as x and y shall both live.

$a_{\overline{\overline{n|}(xyz\ldots.)}}$ = the value of an annuity to continue for n years certain, and as much longer as x, y, z . . . . shall all live.

$a_{\overline{\overline{n|}xy}}^{\;2}$ = the value of an annuity to continue until the failure of two of the three statuses represented by the lives x and y and the term of n years certain; *i.e.*, an annuity to cease on the death of both x and y within n years, or at the expiration of n years if either x or y shall have died within that term, or on the failure of the joint existence of x and y after that term.

Reversionary Annuities.

$a_{y|x}$ = the value of an annuity on the life of x after the death of y.

$a_{z|xy}$ = do. on the joint lives of x and y after the death of z.

$a_{z|\overline{xy}}$ = do. on the life of the last survivor of x and y after the death of z.

$a_{yz|x}$ = do. on the life of x after the failure of the joint existence of y and z.

$a_{\overline{yz}|x}$ = do. on the life of x after the death of both y and z.

$a_{y|x\overline{n}\rceil}$ = do. to commence on the death of y, and to continue payable to the end of n years from the present time or to the death of x, whichever shall first happen.*

$a_{y|\overline{x\overline{n}\rceil}}$ = do. do. do. whichever shall last happen.

$a_{y\overline{n}\rceil|x}$ = do. on the life of x, to commence on the death of y or at the expiration of n years, whichever may first happen.

$a_{\overline{y\overline{n}\rceil}|x}$ = do. on the life of x, to commence on the death of y or at the expiration of n years, whichever shall last happen.

Obs. These annuities may be deferred, temporary, or intercepted. Thus

$$_{n|}a_{y|x}, \qquad _{|n}a_{y|x}, \qquad _{n|t}a_{y|x}.$$

N.B. In explanation of the principle of this notation, it is to be observed that the letters or numbers placed at the right-hand lower corner of the principal symbol for an annuity or assurance, refer exclusively to lives; while letters or numbers placed at the left-hand lower corner refer exclusively to terms of years: also, that a letter or number placed on the left-hand side of the upright stroke, |, denotes a life or a term of years, as the case may be, for which the benefit is deferred.

Obs. Deferred and intercepted annuities may be considered as a special kind of reversionary annuities, if we consider a term of years as a special kind of life, as explained above. Thus

$$_{n|}a_x = a_{\overline{n}\rceil|x}.$$

Also,
$$_{n|t}a_x = a_{\overline{n}\rceil|\overline{n+t}\rceil x};$$

* This benefit must not be confounded with the annuity to commence on the death of y, and to continue payable for n years if x shall live so long; for in that case the term of n years does not begin to run until the death of y.

that is, an annuity on the life of x, deferred n years and then to continue t years, is equal to an annuity for so much of the joint existence of the life x and the term of $n+t$ years reckoned from the present time, as remains after the termination of n years.

N.B. In the above reversionary annuities, it is assumed that the first payment of the annuity is made at the end of the year in which the first life (or status) fails; and that the last payment is made at the end of the year preceding that in which the life (or status) during which the annuity is to be enjoyed, fails.

If, however, the annuity is to run from the day of the failure of the first life (or status) to the day of the failure of the second life (or status); as, for example, from the day of the death of y up to the day of the death of x, the first payment being made one year after the death of y; the annuity is by analogy called *complete*, and is denoted by

$$\mathring{a}_{y|x}, \qquad \mathring{a}_{z|xy}, \qquad \mathring{a}_{yz|x}, \qquad \text{\&c.}$$

If the first payment falls due on the day of the failure of the first life (or status), or the annuity is payable in advance, being still supposed to be continued to the day of the failure of the second status, it is denoted by

$$\mathring{\mathbf{a}}_{y|x}, \qquad \mathring{\mathbf{a}}_{z|xy}, \qquad \mathring{\mathbf{a}}_{yz|x}, \qquad \text{\&c.}$$

If these annuities are payable half-yearly, quarterly, &c., this will be denoted in the same way as for annuities on single lives. Thus,

$\mathring{a}^{(2)}_{y|x}$ = the value of an annuity on the life of x, of which a payment, $\frac{1}{2}$, is first made six months after the death of y, and thenceforward half-yearly, a proportionate part of the half-year's annuity being payable on the death of x.

$\mathring{\mathbf{a}}^{(2)}_{y|x}$ = the value of an annuity on the life of x, of which a payment, $\frac{1}{2}$, is first made on the day of the death of y, and thenceforward half-yearly, a proportionate part of the annuity being payable on the death of x.

Contingent Annuities.

$a^{1}_{yz|x}$ = the value of an annuity on the life of x after the death of y, provided he die before z.

$a^{2}_{yz|x}$ = the value of an annuity on the life of x after the death of y, provided he die after z.

$a^{1}_{y\overline{n|}|x}$ = the value of an annuity on x after the death of y, provided he die within n years.

Survivorship Annuities.

$a_{xy'xy}$ = the value of an annuity to commence on the death of the first of x and y, and continue to the death of the second.

$a_{xyz|\overline{xyz}}$ = the value of an annuity to commence on the death of the first of the three lives x, y, and z, and continue to the death of the last.

$a_{\overline{xyz}^2|\overline{xyz}}$ = the value of an annuity to commence on the death of two of the three lives x, y, and z, and continue to the death of the last.

$a_{xyz|\overline{xyz}^2}$ = the value of an annuity to commence on the death of the first of the three lives x, y, and z, and continue so long as the other two are jointly in existence.

Annuities Certain.

$a_{\overline{n|}}$ = the value of an annuity certain for n years.

a_∞ = a perpetuity.

${}_n|a_\infty$ = a perpetuity deferred n years.

${}_n|a_{\overline{t+n|}}$ or $a_{\overline{n|}}|_{\overline{t+n|}}$ = a temporary annuity certain of t years deferred n years.

Annuities on Successive Lives.

N.B. When a letter or number is placed within brackets, ( ), the status denoted by it is to be nominated at the expiration of the status denoted by the letter or number immediately preceding.

$a_{\overline{x(y)}}$ = the value of an annuity on the successive lives of x and y; y being nominated at the death of x.

$a_{\overline{x(\overline{n|})}}$ = the value of an annuity on the life of x, and for n years longer.

$a_{\overline{x(y)(z)}}$ = the value of an annuity on the successive lives of x, y, z.

$a_{\overline{x(\overline{n|})}.y}$ = the value of an annuity for the joint lives of x and y, and for n years longer if y shall live so long.

$a_{x|(y)}$ = the value of an annuity on the life of y, who is to be nominated on the death of x.

$a_{x|(\overline{n|})}$ = the value of an annuity for n years certain, commencing at the death of x.

$a_{\overline{x(y)}|(z)}$ = the value of an annuity on the life of z, who is to be nominated on the failure of the successive lives of x and y.

$a_{x|(\overline{n|})y}$ = the value of an annuity to commence on the death of x, and continue for n years if y shall live so long.

$a_{x|\overline{(\overline{n|})y}}$ = the value of an annuity to commence on the death of x, and continue for n years certain and as much longer as y may live.

Obs. Any of the preceding annuities may be continuous, in which case $\bar{a}$ is used instead of a; or they may be complete, in which case $\mathring{a}$ is used. The last five annuities, when complete, run, like ordinary reversionary annuities, from the day of the failure of the status, or life, for which the annuity is deferred, to the day of the failure of the status, or life, for which it is enjoyed.

Assurances.

A_x = the present value of an assurance of 1, payable at the end of the year in which x shall die; or, simply, an assurance on x.

N.B. An assurance is always understood to be for 1 unless otherwise stated.

Obs. An assurance may, just like an annuity, depend on the failure of two or more joint lives, or on the failure of the last survivor of two or more lives. It may also be deferred, temporary, or intercepted. Thus we have assurances

Immediate.	Deferred.	Temporary.	Intercepted.
A_x	$_{n\|}A_x$	$_{\|n}A_x$	$_{n\|t}A_x$
A_{xy}	⋮	⋮	⋮
A_{xyz}	⋮	⋮	⋮
$A_{\overline{xy}}$	⋮	⋮	⋮
$A_{\overline{xyz}}$	⋮	⋮	⋮
$A_{\overline{xyz}}^{2}$	⋮	⋮	⋮
⋮	⋮	⋮	⋮

$A_{\overline{xy}.z}$ = the value of an assurance payable on the death of z or on the death of the last survivor of x and y whichever may first happen.

$A_{\overline{(xy)}z}$ = the value of an assurance payable on the failure of the joint lives x and y or on the death of z whichever shall last happen.

$$
\begin{aligned}
{}^{1}A_x &= A_{x+1} & \qquad {}^{1}A_{xy} &= A_{x+1\cdot y+1} \\
{}^{-1}A_x &= A_{x-1} & &\vdots \\
{}^{n-m}A_x &= A_{x+n-m} & &\vdots \\
&\vdots
\end{aligned}
$$

Similarly for the other assurances.

$\left.\begin{array}{r} A_x^{(m)} \\ A_{xy}^{(m)} \\ \vdots \end{array}\right\}$ = the values of assurances payable at the end of that m-part of a year in which the life or status shall fail.

$\left.\begin{array}{r} \bar{A}_x \\ \bar{A}_{xy} \\ \vdots \end{array}\right\}$ = the values of continuous assurances, or assurances payable at the instant when the life or status shall fail.

Endowment Assurances.

$|_n Æ_x$ or $A_{x\overline{n}|}$ = the value of an assurance on the joint duration of the life x and the term of n years certain;

= the value of an endowment assurance on x, payable on his attaining the age $x+n$, or at the end of the year in which he shall previously die.

$|_n Æ_{xy}$ or $A_{xy\overline{n}|}$ = the value of an endowment assurance payable in n years if both x and y are then alive, or at the end of the year in which either x or y shall previously die.

$|_n Æ_{\overline{xy}}$ or $A_{\overline{xy}.\overline{n}|}$ = the value of an endowment assurance payable in n years if either x or y is then alive, or at the end of the year in which the survivor of them shall previously die.

$_{t|}{}_{n-t}Æ_x$ or $_{t|}A_{x\overline{n}|}$ = the value of an endowment assurance deferred t years, that is, an assurance payable if x shall die after t years but before n years, or if he shall attain the age $x+n$.

Contingent Assurances.

A^{1}_{xy} = the value of a contingent assurance on x against y, *i.e.* payable at the end of the year in which x shall die, if he leave y surviving.

$A^{2}_{x\cdot y}$ or $A_{y\,x}$ = the value of an assurance payable at the end of the year in which x shall die provided he die after y.

Obs. These assurances may be deferred, temporary, or intercepted :—

Deferred.	Temporary.	Intercepted.
${}_{n\|}A^{1}_{xy}$,	${}_{\|n}A^{1}_{xy}$,	${}_{n\|t}A^{1}_{xy}$
${}_{n\|}A_{y\|x}$,	${}_{\|n}A_{y\|x}$,	${}_{n\|t}A_{y\|x}$

They may also be modified in other respects as ordinary assurances.

Thus

$$A^{(m)\,1}_{\;xy},\qquad A^{(m)\,2}_{\;x:y}\quad\text{or}\quad A^{(m)}_{y|x},$$

denote assurances payable at the end of that m-part of a year in which x shall die first and second respectively of the two lives.
And

$$\bar{A}^{1}_{xy},\qquad \bar{A}^{2}_{x:y}\quad\text{or}\quad \bar{A}_{y|x},$$

denote continuous contingent assurances payable at the instant when x shall die first and second respectively of the two lives.

$A^{1}_{x:\overline{y(\overline{t|})}}$ = the value of an assurance on x provided he die before y or within t years after him.

$A_{\overline{y(\overline{t|})}|x}$ = the value of an assurance on x provided he die more than t years after the death of y.

$A_{\overline{x(y)}}$ or $A_{x|(y)}$ = the value of an assurance on y who is to be nominated on the death of x.

$A_{\overline{x(\overline{n|})}}$ or $A_{x|(\overline{n|})}$ = the value of an assurance to be payable n years after the death of x.

We have

$A_{x\overline{n|}}^{\;\;1}$ = the value of 1 payable at the end of n years provided x be then alive ;

= the value of an endowment on x payable in n
= ${}_nE_x$ years;

$A^{1}_{x\overline{n|}}$ = the value of 1 payable on the death of x provided that take place before the end of n years;

= the value of a temporary assurance for n years on x;
= ${}_{|n}A_x$.

Just as $A^{1}_{xy}+A_{xy}^{\;\;1}=A_{xy}$, we have $A^{1}_{x\overline{n|}}+A_{x\overline{n|}}^{\;\;1}=A_{x\overline{n|}}$,—an equation expressing that an endowment assurance is the sum of a temporary assurance and an endowment.

Survivorship Assurances involving Three Lives.

$$\left.\begin{array}{l} A^{1}_{x:yz}\\ A^{2}_{x:yz}\\ A^{3}_{x:yz}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance on } x\\ \quad\text{provided he die}\end{array} \left\{\begin{array}{l}\text{first}\\ \text{second}\\ \text{third}\end{array}\right\} \begin{array}{l}\text{of the three}\\ \quad\text{lives.}\end{array}$$

$$\left.\begin{array}{l} A^{1.2}_{x:yz}\\ A^{1.3}_{x:yz}\\ A^{2.3}_{x:yz}\end{array}\right\} = \left\{\begin{array}{l}\text{the value of an assur-}\\ \quad\text{ance on } x \text{ provided}\\ \quad\text{that he die}\end{array}\right\} \left\{\begin{array}{l}\text{either 1st or 2nd}\\ \quad ,, \quad \text{1st ,, 3rd}\\ \quad ,, \quad \text{2nd ,, 3rd}\end{array}\right\} \quad ,,$$

$$A_{\underset{1}{xyz}} = \begin{array}{l}\text{the value of an assurance on the joint lives of } x, y,\\ \quad z, \text{ provided } x \text{ die first.}\end{array}$$

Hence $A^{1}_{x:yz}=A_{\underset{1}{xyz}}$: also $A^{2.3}_{x:yz}=A_{yz|x}$.

$$\left.\begin{array}{l} A_{\underset{1}{\overline{xyz}}}\\ A_{\underset{2}{\overline{xyz}}}\\ A_{\underset{3}{\overline{xyz}}}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance on the last sur-}\\ \quad\text{vivor provided that } x \text{ die}\end{array} \left\{\begin{array}{l}\text{first,}\\ \text{second,}\\ \text{third.}\end{array}\right.$$

Hence $A^{3}_{x:yz}=A_{\underset{3}{\overline{xyz}}}=A_{\overline{yz}|x}$.

$$\left.\begin{array}{l} A_{\underset{1}{\overline{xyz}}^{2}}\\ A_{\underset{2}{\overline{xyz}}^{2}}\\ A_{\underset{3}{\overline{xyz}}^{2}}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance payable on the}\\ \quad\text{second death provided that } x \text{ die}\end{array} \left\{\begin{array}{l}\text{first,}\\ \text{second,}\\ \text{third.}\end{array}\right.$$

Hence $A^{2}_{x:yz}=A_{\underset{2}{\overline{xyz}}^{2}}$.

$$\left.\begin{array}{l} A^{1}_{\overline{xy}:z}\\ A^{2}_{\overline{xy}:z}\\ A^{3}_{\overline{xy}:z}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance payable on the}\\ \quad\text{death of } x \text{ or } y \text{ provided either of them die}\end{array} \left\{\begin{array}{l}\text{first,}\\ \text{second,}\\ \text{third.}\end{array}\right.$$

$$A_{\underset{1}{\underbrace{xy}z}} = \begin{array}{l}\text{the value of an assurance on the joint lives of } x, y,\\ \quad z, \text{ provided either } x \text{ or } y \text{ die first.}\end{array}$$

Hence $A^{1}_{\overline{xy}:z}=A_{\underset{1}{\underbrace{xy}z}}$.

$$\left.\begin{array}{l} A^{1.2}_{\overline{xy}:z}\\ A^{1.3}_{\overline{xy}:z}\\ A^{2.3}_{\overline{xy}:z}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance payable on}\\ \quad\text{the death of } x \text{ or } y \text{ provided either}\\ \quad\text{of them die}\end{array} \left\{\begin{array}{l}\text{1st or 2nd,}\\ \text{1st ,, 3rd,}\\ \text{2nd ,, 3rd.}\end{array}\right.$$

$$\left.\begin{array}{l} A_{\overline{xy}:\underset{1}{z}}\\ A_{\overline{xy}:\underset{2}{z}}\\ A_{\overline{xy}:\underset{3}{z}}\end{array}\right\} = \begin{array}{l}\text{the value of an assurance on the last}\\ \quad\text{survivor of } x \text{ and } y \text{ provided that}\\ \quad z \text{ die}\end{array} \left\{\begin{array}{l}\text{first}\\ \text{second}\\ \text{third}\end{array}\right\} \begin{array}{l}\text{of the}\\ \text{three.}\end{array}$$

Hence $A_{\overline{xy}:\underset{1}{z}} = A_{\underset{1}{\overline{xyz}}}$;

$A_{\overline{xy}:\underset{2}{z}} = A_{\underset{2}{\overline{xyz}}}$;

$A_{\overline{xy}:\underset{3}{z}} = A_{\underset{3}{\overline{xyz}}}2$.

$\left.\begin{array}{l} A_{\overline{xy}\ \underset{1.3}{z}} \\ A_{\overline{xy}:\underset{2.3}{z}} \end{array}\right\}$ = the value of an assurance on the last survivor of x and y provided that z die $\left\{\begin{array}{l} \text{1st or 3rd} \\ \text{2nd ,, 3rd} \end{array}\right\}$ of the three.

$\left.\begin{array}{l} A^{2}_{x:\underset{1}{yz}} \\ A^{3}_{x:\underset{1}{yz}} \\ A^{2.3}_{x:\underset{1}{yz}} \end{array}\right\}$ = the value of an assurance on x provided that he die $\left\{\begin{array}{c} \text{2nd} \\ \text{3rd} \\ \text{2nd or 3rd} \end{array}\right\}$ and that z die first of the three.

$\left.\begin{array}{l} A^{1.2}_{x:\underset{1}{yz}} \\ A^{1.3}_{x:\underset{1}{yz}} \end{array}\right\}$ = the value of an assurance on x provided he die $\left\{\begin{array}{l} \text{1st or 2nd} \\ \text{1st ,, 3rd} \end{array}\right\}$ and provided that in the latter case z die first of the three.

$\left.\begin{array}{l} A_{\underset{1}{\overline{x(yz)}}} \\ A_{\underset{2}{\overline{x(yz)}}} \end{array}\right\}$ = the value of an assurance on the last survivor of x and y provided that z die $\left\{\begin{array}{l} \text{before } y, \\ \text{after } y. \end{array}\right.$

$A_{\underset{1}{\underbrace{x:y}z}}$ = the value of an assurance on x provided that either x or y die first of the three.

$A^{2\ 1}_{x:y(\overline{t}|)}$ = the value of an assurance on x provided he die after y, but within t years after his death.

$A^{3\ 1}_{x:y(\overline{t}|)}$ = the value of an assurance on x provided he die after y, but more than t years after his death.

Annual Premiums.

ϖ_x or P_x = annual premium for an assurance on x.

$\left.\begin{array}{r} \varpi_{xy} \text{ or } P_{xy} \\ \varpi_{xyz} \text{ or } P_{xyz} \end{array}\right\}$ = do. do. on joint lives of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$\left.\begin{array}{r} \varpi_{\overline{xy}} \text{ or } P_{\overline{xy}} \\ \varpi_{\overline{xyz}} \text{ or } P_{\overline{xyz}} \end{array}\right\}$ = do. do. on last survivor of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$\overset{1}{\varpi}_{xy}$ or P^{1}_{xy} = do. do. on x provided he die before y.

$P_{|n}A_x$ = do. for a temporary assurance for n years on x.

$\left.\begin{array}{r} P_{|n}A_{xy} \\ P_{|n}A_{xyz} \end{array}\right\}$ = do. do. on joint lives of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$\left.\begin{array}{r} P_{|n}A_{\overline{xy}} \\ P_{n}A_{\overline{xyz}} \end{array}\right\}$ = do. do. on last survivor of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$P_{n}A^{1}_{xy}$ = do. do. on x provided he die before y.

N.B. If desired, the letter A can be dispensed with in the case of temporary assurances, by regarding a temporary assurance as a special kind of contingent assurance, as explained above. Thus,

$P^{1}_{x\overline{n}|}$ = annual premium for $A^{1}_{x\overline{n}|}$; or for a temporary assurance for n years on x.

$P_{x\overline{n}|}^{\;\;1}$ = annual premium for $A_{x\overline{n}|}^{\;\;1}$, or for an endowment on x payable in n years.

Similarly, $P_{x\overline{n}|}$ will denote the annual premium for $A_{x\overline{n}|}$, that is to say, for an endowment assurance on the life of x, payable in n years. Thus,

$$\left.\begin{array}{r} P_{x\overline{n}|} \\ P_{xy\overline{n}|} \\ P_{xyz\overline{n}|} \\ P_{\overline{xy}\overline{n}|} \\ P_{\overline{xyz}\overline{n}|} \end{array}\right\} = \text{annual premiums for endowment assurances payable in } n \text{ years, depending on the life or lives denoted by the suffixes.}$$

If the premium is payable half-yearly or quarterly, we denote the half-yearly premium by $\underset{2}{P}$, and the quarterly premium by $\underset{4}{P}$.

The symbols $P^{(2)}$, $P^{(4)}$, $P^{(m)}$, will, by analogy with $a^{(2)}$, &c., denote the total yearly premium when it is payable by half-yearly, quarterly, or m-ly instalments.

So, also, $\overline{P}$ will denote the total yearly premium when it is payable by momently instalments.

If the annual premium is payable for m years only, this is denoted by prefixing a subscript m to the P. Thus,

$${}_mP_x, \qquad {}_mP_{xy}, \qquad {}_mP_{x\overline{n}|}, \qquad \text{\&c.}$$

If it should ever be desired to have the annual premium deferred for a term of years, this would be expressed by the symbol ${}_{m|}P$. Thus, for instance, if the annual premium for an intercepted assurance were payable at the beginning of each year during the continuance of the benefit, such premium would be denoted by ${}_{n|t}P_{n|t}A_x$.

Obs. If we wish to denote the annual premium for any other benefit, this may be done by prefixing P to the benefit.

Thus,

$P_{n|}a_x$ = the annual premium for a deferred annuity.

$P_{n|}\text{a}_x$ = the same, the first payment of the annuity being in n years.

If the premium and the annuity in the latter case are both to be payable half-yearly, the half-yearly premium will be denoted by

$$\underset{2}{P}_{n|}a_x^{(2)}$$

Values of Policies.

$_nV_x$ = value of a policy for 1 on the life of a person of the age x at entry after it has been n years in force, the premium being just due and unpaid.

$\left.\begin{array}{r} _nV_{xy} \\ _nV_{xyz} \end{array}\right\}$ = do. on the joint lives of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$\left.\begin{array}{r} _nV_{\overline{xy}} \\ _nV_{\overline{xyz}} \end{array}\right\}$ = do. on the last survivor of $\left\{\begin{array}{l} x \text{ and } y, \\ x, y, \text{ and } z. \end{array}\right.$

$_nV_{x\overline{m}|}$ = value of the endowment assurance $A_{x\overline{m}|}$ after it has been in force n years.

$\left.\begin{array}{r} _nV_{xy\overline{m}|} \\ _nV_{\overline{xy}.\overline{m}|} \end{array}\right\}$ = do of the endowment assurance $\left\{\begin{array}{l} A_{xy\overline{m}|}, \\ A_{\overline{xy}\,\overline{m}|}. \end{array}\right.$

$_nV^1_{xy}$ = value of a contingent policy on x against y after it has been n years in force.

If n years and a fractional part, r, of another year have elapsed, the value of the policy may be denoted by $_{n+r}V_x$.

The value at the end of n years, the premium being just paid, may be denoted by $_{n+0}V_x$.